

Contractors *and* Engineers Monthly

Vol. 37, No. 11

NOVEMBER, 1940

\$2 a Year, 20 Cents a Copy

Highlights Of This Issue

Flood Control

The U.S.E.D. flood-control program to prevent the disastrous effects of floods suffered in recent years is being carried on in all parts of the country from California to New Hampshire. A description of the earth and rock work at the 1,700-foot long Franklin Falls Dam in the latter state appears in this issue.

See page 2.

Resurfacing Town Roads

An interesting and helpful discussion of methods and quantities for tar road mix is included in a description of road-mix resurfacing on a town road in Massachusetts.

See page 2.

A Dream Come True

In 23 months, American engineers, contractors, equipment, and efficiency combined to make the 160-mile super-highway from Pittsburgh to Harrisburg, Penna., dubbed by some as a "dream highway", into a reality. Following a series of articles on various phases of its construction is a description and the Editor's impressions of the finished project.

See page 7.

Better Roadsides

New Jersey has under way an interesting roadside-development project along the Rockefeller Memorial Highway, a heavily traveled route leading to many Jersey shore resorts.

See pages 4 and 10.

Paving Without Pavers

A highway job in Utopia should have something novel about it, and a 6-mile concrete paving job at Utopia, Ohio, was no exception. Among its features were the speed of progress and the use of truck mixers for pouring the slab.

See page 15.

Servicing Highway Machines

Yankee ingenuity and economy have combined to provide for the Maine State Highway Commission, an efficient system for the inspection and overhauling of equipment owned by the Commission for use in maintenance and snow removal on Maine highways.

See page 21.

IN THIS ISSUE

Bituminous Roads.....	2
Bridge Construction.....	11
Cartoon.....	4
Concrete Roads.....	15
County Road Work.....	1
Dam Construction.....	2
Editorial.....	4
Grading.....	19
Legal Decisions.....	28
Maintenance Garages.....	21
News Photos.....	22, 23
Pennsylvania Turnpike.....	7, 22, 23
Road Mix.....	2
Roadside Development.....	4, 10
Snow Removal.....	1
Town Roads.....	2

When It Snows, It SNOWS In Onondaga County, N. Y.

CONSTRUCTION TRESTLE AT FRIANT DAM



Bureau of Reclamation Photo

Working some 200 feet above the bedrock foundation for Friant Dam in California, steel men extend the construction trestle, which will be 2,300 feet long when completed, across the canyon at the dam site. At the lower right, the San Joaquin River is seen flowing through a temporary diversion flume.

Central New York County Well-Organized for Year-Round Maintenance of a 758-Mile Highway System

(Photo on page 44)

✦ OUR paraphrase of the well-known Morton Salt Co. slogan "When It Rains It Pours," rightfully applies to Onondaga County in Western New York State which lies in that snow belt of snow belts, rivaling many mountain passes. The depth of snow that fell in this agricultural and manufacturing county in the winter of 1939-40 varied from 150 to 160 inches. Plows were out working even over the weekend of April 20-23, 1940, in the final fall of about 4 inches.

Covering 781 square miles near the east end of Lake Ontario, the county is swept by the northwest winter winds laden with moisture which is precipitated as snow on highway and field alike. Snow removal is somewhat complicated because of the division of responsibility. In New York State, the state highway department assumes no responsibility for snow removal on state highways beyond a "token" payment of \$50 per mile to the county for plowing state highways. Thus, Onondaga County plows 296 miles of state highway outside of villages and 33.86 miles within villages, and the towns plow 420.75 of the total of 757.90 miles of county roads. This makes a grand total of 667.01 miles of state and county highways which are plowed by county equipment.

Organization for Snow Removal

Headquarters for all county highway activities, including snow removal, are in Syracuse, close to the center of the county. The main garage and repair shop are located at Jamesville, which is a little southeast of the geographic center of the county. Another storage and maintenance shop is located at North Syracuse, and it is expected within a year or two that one additional storage and maintenance shop will be built west of Syracuse to cover that area.

The battery which is called upon to attack all snow storms consists of 47 Walter Snow Fighters, equipped with hydraulically controlled Frink V-plows and wings. The highways to be plowed are divided into 38 routes of variable lengths, depending on the character of the grades and the distance from the shops. All trucks are routed out of the Jamesville shops or from North Syracuse for the entire county, as many as six trucks traveling over the same main route to reach their plowing routes. These routes average 75 to 100 miles.

(Continued on page 34)

Earth and Rock Work And Aggregate Plant Features of N. H. Dam

**U.S.E.D. Flood-Control
Project at Franklin, N. H.,
Being Built by Three
Well-Known Contractors**

(Photos on page 44)

† THE construction of one of the largest flood-control structures in New England, the Franklin Falls Dam, at Franklin, New Hampshire, on the Pemigewasset River, was started under the direction of the U. S. Engineer Office, Boston, Mass., on November 14, 1939, by Coleman Bros. Corp., of Boston, as general contractor, Sammons, Robertson, Henry, of Huntington, W. Va., subcontractor on rock work and the Great Lakes Dredge & Dock Co., of Chicago, subcontractor on concrete structures. The structure will control the flood flows of the Pemigewasset River, a flashy stream which joins with the Winnepesaukee River at Franklin to form the Merrimack River, by impounding flood flows in a pool about 12 miles long extending to the tail race of the Ayers Island hydro-electric power plant dam just above Bristol, N. H.

The dam proper is 1,700 feet long at the crest and 130 feet high at mid-stream. The protective structures include the spillway approach channel, the spillway proper, and the spillway discharge channel, the latter cut through rock. The service structures include the outlet approach channel, the gate house with its service bridge from the top of the dam, two arched conduits through the dam, a stilling basin and the outlet discharge channel merging with the spillway discharge channel.

Design of Dam

The dam is being built with a compacted impervious clay core 18 feet wide at the top and increasing in thickness 1 foot in 8 vertically on each side. All mucky sand will be removed from the river bed before the river section of the embankment is started next year and the rock at the west end of the dam is cleaned before the earth fill is placed. On the upstream side of the core a compacted pervious blanket is placed to Elev. 312, topped with 3 feet of the same material as the core for a distance of 705 feet upstream in the river section. Against the upstream face of the core is a compacted pervious fill carried out on a slope of 1 on 1.75 down to the compacted impervious blanket. On this is a compacted selected pervious fill on a slope of 1 on 2.75, protected

from Elev. 416.0 down to Elev. 328.0 by a 4-foot blanket of sand and gravel, and on top of this a rock fill down to Elev. 328 laid on varying slopes from 1 on 3 to 1 on 3.25 and 1 on 3.5. This rock fill will protect the upstream face of the dam from wave action.

The spillway crest will be at Elev. 389.0. A dumped fill of waste material is carried on a slope of 1 on 200 from the top of the rock fill at Elev. 342 to the top of the upstream cofferdam 705 feet upstream of the center line of the core. The upstream cofferdam is 40 feet wide at the top at Elev. 340.0 and is comprised of dump fill (waste material) with a slope of 1 on 2 both upstream and downstream and covered with 3 feet of rock fill on 1 foot of gravel on the upstream face. A special sand and gravel toe is incorporated in the downstream face of the upstream cofferdam, being 15 feet wide at the top and with the same slopes as the cofferdam itself.

The downstream portion of the dam will have a compacted pervious fill with a slope of 1 on 2.33 from Elev. 411.0 down to Elev. 355.0. In the stream bed, 130 feet downstream from the center line of the core, is the center line of a transverse drain 15 feet wide at the bottom and with slopes of 1 on 1.75 upward filled with gravel on a 3-foot layer of sand. A 3-foot layer of gravel with



C. & E. M. Photo Franklin Falls Dam as it appeared on September 23, 1940.

2 feet of sand on top forms a filter above this large trench drain, aimed to remove all moisture without permitting the flow of any solid material in the downstream section of the dam. Immediately above this drain and centered slightly downstream is a compacted selected pervious fill which is extended across the entire toe of the dam to the stripped bank on the east abutment. The slope of this selected pervious fill is 1 on 2 upstream and 1 on 2.33 downstream. This will be surfaced with 4 feet of sand and gravel applied from the top of the dam at Elev. 416.0 and then the entire face of the dam will be covered with a heavy rock fill on slopes varying from 1 on 2.5 through 1 on 2.75 and 1 on 3.5 down to Elev. 330.0. This rock fill will then extend down to Elev. 320 at a point 550 feet downstream of the center line of the core. The toe of the rock fill is sloped 1 on 2.

Placing Fill in Dam

The clay borrow for the core and other impervious fill is being taken

from a large clay bank on N.H. Route 11. This bank has been a source of considerable trouble to the State Highway Department of New Hampshire for many years as the clay has sloughed off the face of the bank down onto the highway during every heavy storm, causing high maintenance costs for this particular section of road. Thus, the use of this bank for impervious material for the dam has caused considerable joy in highway headquarters. The clay is loaded by a new Koehring 801 2-yard shovel and a Lorain 13½-yard diesel shovel to a fleet of 13 to 20 hired trucks which have a haul of 3.7 miles over state highways to the site of the dam. A single Euclid Trac-Truk is maintained for hauling out the stripping for wasting.

The impervious clay is placed in 6-inch layers and must be compacted by six passes of the tractor treads in addition to the compaction by two LaPlant-Choate and Euclid sheepsfoot rollers pulled by the same tractor. For mixing the clay when first placed, the Allis-Chalmers tractor pulls two sets of 24-inch Rome disks. This works all the stones to the surface as all rock over 6 inches must be removed from all fills and all of 3 inches from the blanket layers. These stones are rooted out by a new device built on the job and christened with the two frightful names "Wumpus" or "Walupus", for no good reason. This open-type bulldozer with teeth is welded to the pusher frame of a Baker bulldozer.

The clay used in the impervious fill has actually only about 10 per cent clay, the balance being fine sand. This material has an optimum moisture content of 12 per cent for maximum density which runs up to 140 pounds per cubic foot. The material will run up on the track of the tractor when the moisture gets above 13 per cent and when it drops much below 11 per cent the material crumbles, so little trouble is experienced in getting every one to work toward compacting the material with the optimum moisture content.

As the material is dumped by the trucks it is spread by a Caterpillar D8 diesel tractor with a LaPlant-Choate bulldozer and is then sprinkled judiciously. Water for sprinkling is furnished by a 4-inch Dean-Hill centrifugal pump with an 8-inch suction, driven by a 75-hp General Electric motor. This outfit develops 140 pounds pressure in the 6-inch discharge at the pump. The pipe line from the shore of the Pemigewasset River to the far end of the fill is laid with Dresser couplings.

Since the specifications require that all material which cannot be compacted by the tractors be carefully packed by pneumatic tampers, the contractor uses two Chicago-Pneumatic tampers run by a Gardner-Denver portable compressor to compact the material within 2 feet of the caisson pipe.

The 5 miles of construction road, which is used almost continuously for hauling fill, is maintained constantly by a Galion power grader. The frequency with which there were narrow escapes from accidents in the heavy cloud of dust over this road during the

(Continued on page 12)

Old Trial Road Mix Resurfaced With New

**Experimental Work of 1920
In Town of Wareham, Mass.,
Decrowned and Resurfaced
As a State-Aid Project**

† A section of old U. S. 28, before it was relocated, in the Town of Wareham, Mass., was the scene of some experimental road-mix operations some time previous to 1910 before the method had developed to its present status. A distance of 0.7 mile from the Rochester-Wareham line to Tremont Pond Bridge was constructed by hand-mixing gravel aggregate and various oils and the use of harrows to supplement the hand work. Even though the road now carries much less traffic since U. S. 28 was relocated and paved with a standard Massachusetts penetration macadam, it is an important secondary road. It has too high a crown, the road surface is wavy and cracked and in general is dangerous for modern traffic.

A Chapter 90 project was set up under the direction of John E. Troy,

District Engineer, Massachusetts Department of Public Works, and John B. English, Superintendent of Streets, of the Town of Wareham, to decrown and resurface the worst sections with new road mix and to install additional drainage where necessary. Under this arrangement one-third of the work was paid by the county, one-third by the town and one-third by the state.

Taking Out the Crown

Bank-run gravel was spread with a stone spreader box 10 feet wide and 4 inches thick at one side of the road and then shot with 5 per cent by weight of tar binder, or at the rate of 1 gallon per square yard of 3-inch surface course. If aggregate runs finer, the amount of binder must be increased to as much as 6½ per cent by weight. When the sands in the gravel run coarse, loam and fine sand are added to as much as 10 per cent. On this job, Massachusetts specification T6 was used, applied at 130 degrees F. Tarvia retread meeting

(Concluded on page 20)



C. & E. M. Photo
A Lima 101 working in close quarters to load rock from conduit excavation.

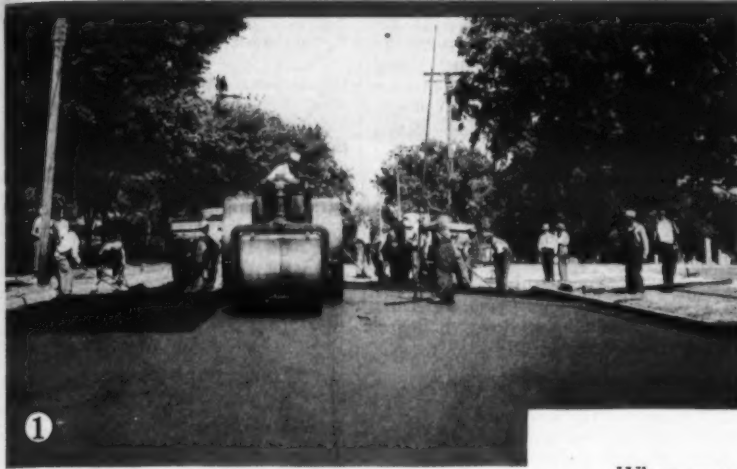


C. & E. M. Photo
The tractor equipped with a "Wumpus" for rooting out stones in the fill.



C. & E. M. Photo
A truck-mounted press for track pins at Coleman Bros.' field shop.

A man who knows ASPHALT



1 Paving with Texaco Sheet Asphalt in Freeport, Ill.

2 Laying an Intermediate-type Texaco Asphalt road in Roscommon County, Mich.

3 Road-mix method of constructing low-cost Texaco Asphalt road in Colorado.

4 Applying a heavy Texaco Asphalt Surfacing Material to Connecticut highway.

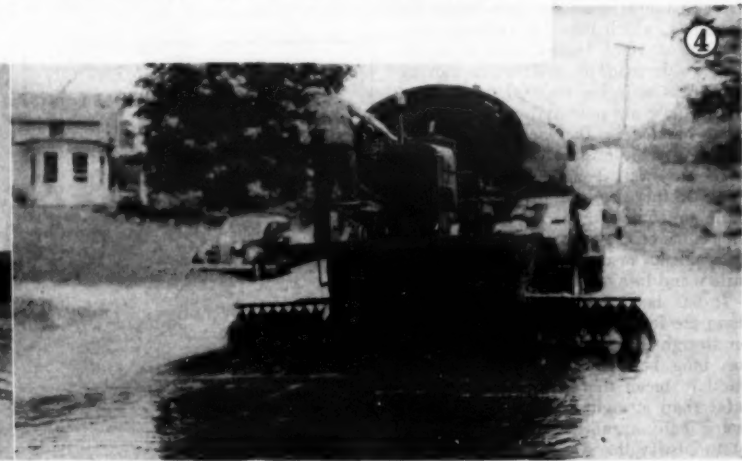
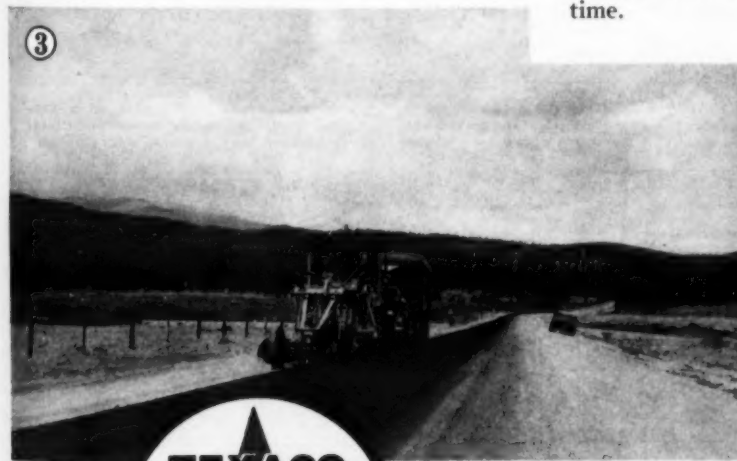
When you discuss a road or street problem with a Texaco Asphalt representative, you are talking to a specialist.

This man devotes 100% of his time and his thought to Asphalt.

Consequently he knows Asphalt thoroughly. He understands the special characteristics of every grade, its particular merits and the use for which it is peculiarly fitted.

Texaco Asphalt representatives, who contact road builders in every State east of the Rockies, have averaged approximately 17 years at their jobs; many of them from 20 to 30 years.

For sound, dependable assistance in solving a road or street problem, call in a Texaco Asphalt representative every time.



TEXACO ASPHALT

THE TEXAS COMPANY, Asphalt Sales Department, 135 East 42nd Street, New York City
Chicago Kansas City Houston Jacksonville Philadelphia Richmond Boston

Contractors and Engineers Monthly

THE NATIONAL BUSINESS PAPER FOR CIVIL ENGINEERING
CONTRACTORS AND HIGHWAY ENGINEERS AND COMMISSIONERS

Member of Controlled Circulation Audit

Issued Monthly by Battenheim-Dix Publishing Corp.
Editorial and Business Office: 470 Fourth Ave., New York City
Printed in Mount Morris, Ill., U. S. A.

THEODORE REED KENDALL, Editor
O. E. POTTER, Managing Editor
GEORGE S. CONOVER, Vice President
DONALD V. BUTTENHEIM, General Manager
MYRON MACLEOD, Advertising Manager
HERBERT K. SAXE, Treasurer

BRANCH OFFICES
Chicago, Ill., Daily News Bldg., George S. Conover, Vice President; John T. Dix
San Francisco, Calif., Mills Bldg., Duncan A. Stout

Copyright 1940 by Battenheim-Dix Publishing Corp.

Accidents, Sight Distances And Highway Improvements

Having recently been through an experience in which the lack of sight distance, plus the unpredictable actions of a mule, played a large part in a highway accident, we have given more than the usual thought to the contribution of the highway to accidents. It is the unexpected that traps the normal driver into an accident. The unexpected may be created by sharp horizontal and vertical curves of short sight distance, or obstructions in the form of narrow bridges on widened roads, and both of these types are unbelievably common on many of our heavy-traffic Federal-Aid highways.

The report of the Problem Committee on Analysis of Accident Data of the American Road Builders' Association contains some very pertinent information on the contributions of the highways to accidents; the effect of improvements, aimed to eliminate one type of accident, actually creating another; and the interpretation of accident reports.

Take, for example, the frequent situation of a crest of a hill over which the driver cannot see. He approaches the unknown, which may be a sharp curve to left or right immediately over the hill, a side road, an obstruction moving or otherwise in his rightful traffic lane. All of these are potential causes of accidents created by the lack of sight distance over the crest of the hill. Engineers may well demand in no uncertain terms an increase in highway appropriations to enable them to remove these thousands of crests that are contributors to accidents resulting in economic loss, injury and loss of life.

It has been said so frequently that there are fewer accidents on curves than on straight stretches of highway that it has long been interpreted by the lay mind to mean that curves are actually safer than straight roads and we have heard many arguments from the motorist to justify the statement. The state-

ment, as released frequently by well-meaning highway bureaus, is only a half truth, and it must be blasted from the minds of motorists by the potent dynamite of publicity. If accidents were reported by state and other officials as "per mile of curve" and "per mile of tangent" it would be apparent immediately that curves are much more potent causes of accidents in themselves than straight roads. Statistics create a false report when not approached properly; in this case, for example, there are many more miles of straight highway than there are miles of curves, hence the number of accidents of all kinds that occur on the straight miles, unless held to a common denominator, makes the curves look less hazardous than they really are.

The report of the study of accident experience on 119 miles of two-lane pavement in South Carolina before and after shoulder widening with bituminous treatment is most enlightening. The shoulders of 18-foot and narrower roadways were surfaced with 4 to 6-foot bituminous treatments. The study re-

(Concluded on page 25)

ROADSIDE IMPROVEMENT ON NEW JERSEY HIGHWAY

See Page 10.



C. & E. M. Photo
A Gletrac tractor and cable snaking out an old tree stump.



C. & E. M. Photo
An oak stump being forcibly removed by tractor and cable.



C. & E. M. Photo
A 1,500-gallon water tank with pump, mounted on a Mack truck, and equipped with three garden hose, moved along the route, watering newly planted trees.

Credit to Morris For Research Work

To the Editor

CONTRACTORS AND ENGINEERS MONTHLY
Below is a copy of a letter from Bert Myers, Engineer of Materials and Tests, Iowa State Highway Commission. If you are running any more comment on the use of subgrade felt for concrete pavement, I should be glad to have you add a line to the effect that Mr. Mark Morris also should receive credit for the early research work that led to this practice.

Mr. Myers' letter follows:

"I have noticed on page 4 of the September issue of CONTRACTORS AND ENGINEERS MONTHLY your letter giving me considerable credit for research work on the use of subgrade felt for concrete paving. I believe your memory of this work is faulty.

"Mark Morris deserves much more credit than I for this particular piece of work. If you had substituted his name for mine your statement would have been much more accurate."

Yours truly,
Roy W. Crum, Director,
Highway Research Board

The Road to Mecca

Pilgrims to the holy city of Mecca, from the Red Sea port of Jedda, will have a modern highway next year, it is reported, instead of the rough track of desert now used, as a new highway is now under construction. The improvement of this route is the result of an agreement between the Saudi Arabian



"Good Gosh, Gus, we hit the jackpot!"

Government and the Egyptian Government for work to be undertaken by Egyptian contractors. Egypt is bearing the greater part of the construction costs in the interest of the Moslem religion.



C. & E. M. Photo
Fruiting roadside growth on the Rockefeller Highway in New Jersey.



C. & E. M. Photo
A raw slope along the highway, showing the characteristic sandy material. Much of the growth has been saved.



C. & E. M. Photo
Here is grass taking hold on a fattened slope which was stabilized, mulched with top soil, and planted.



C. & E. M. Photo
A well-cleared area, leaving a forest window with a stand of oak and pine. About 8 miles of the Rockefeller Highway has been so improved.

Method of Widening And Sloping Snow Banks

A new descriptive bulletin has recently been issued by the Roto Wing Co., Mound, Minn., on its Roto Wing. The advantages of its use are shown by means of action photographs of a Roto Wing plow widening well over and beyond the ditch line, a Roto Wing leaving properly sloped snow banks, and another discharging snow from the road, well into the fields. According to the

manufacturer, one trip of a Roto Wing in conjunction with a motor patrol blade will clear a path 18 feet wide.

Copies of this interesting bulletin may be obtained by state, county and town highway engineers direct from the manufacturer by mentioning this item.

New Rock Grapple Catalog

The old saying attributed to Confucius that a picture is worth 10,000 words may or may not be true, but the many illus-

trations in the new Owen rock grapple catalog tell better than words could how this grapple can be used in rehandling and placing large stone, and in wood and stump handling, illustrating many types of jobs on which these grapples have been used.

In addition, the catalog includes a description of the various construction and operating features of Owen rock grapples, with illustrations and specifications of the various sizes and models. Copies of this new 12-page catalog may

be secured by those interested direct from the Owen Bucket Co., 6030 Breakwater Ave., Cleveland, Ohio.

Richmond Co. Moves Plant

After two decades at the same location, the Richmond Screw Anchor Co., Inc., Brooklyn, N. Y., has moved from Bush Street to new quarters at 816-838 Liberty Avenue. This move was necessitated to make way for the new Belt Parkway around New York City.

Greater Safety...Longer Life



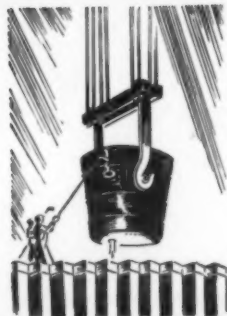
If it's lower rope cost per cubic foot of earth moved that you want—maximum safety for workers—lowest wire rope replacement cost—then Roebling "Blue Center" is the rope for you.

Nearly 100 years of wire fabricating experience have gone into the development of Roebling "Blue Center" Wire Rope. It is Roebling's highest achievement in wire rope manufacture. Specially developed, through years of research, to provide maximum rope durability, safety and economy—Roebling "Blue Center" has established unexcelled records for long, low cost service.

Use Roebling "Blue Center" on all your shovels, scrapers, drag lines and other rope-rigged equipment. Keep accurate service records. Compare. We are confident you will agree with other users—that Roebling "Blue Center" assures the utmost of safety—and lowest rope replacement cost.



JOHN A. ROEBLING'S SONS CO.
Trenton, N. J. Branches in Principal Cities

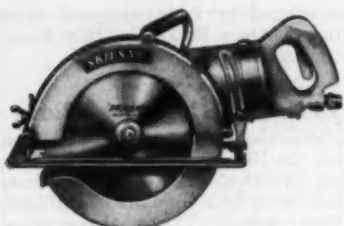


CLOSE CONTROL OF WIRE ROPE QUALITY

When it comes to making wire rope of exceptionally great strength and stamina, like Roebling "Blue Center", ordinary production methods won't do. Painstaking care and skill of the highest order must be exercised.

Typical of this care is the close control of quality used in making Roebling "Blue Center" Wire Rope... control from molten steel to finished product.

ROEBLING "BLUE CENTER" The Finest of all Roebling Wire Ropes



The new Model 2127 Skilsaw

New Pneumatic Saw With 12-Inch Blade

The new Skilsaw Model 2127 pneumatic saw, recently announced by Skilsaw, Inc., 4769 Winnemac Ave., Chicago, Ill., is designed for use by contractors for dams, dry docks, bridges, water-way superstructures, and similar work involving the use of wood for construction or for forms. This new air-operated saw will also cut tiles, terra cotta and similar materials.

The Skilsaw Model 2127 is powered by a rotary-type motor connected to the worm shaft by a star connector. This flexible connection is designed to dissipate vibration resulting from load variation. The rotor is of one piece construction, supported by two oversized ball bearings, and is anchored at the lower end through the bearing to the end plates, thereby maintaining alignment of the rotor within the cylinder bushing and also clearance between the rotor and end plate.

Live air is directed below the rotor blades to provide instant starting at maximum torque and exhaust air is taken out through the end plate. A governor regulates speed and reduces air consumption, as well as providing for feeding only the required amount of air to the motor. The rotor blades and cylinder wall are automatically lubricated through a single adjustment metallic oiler from a large reservoir. Zerk oilers are provided for the lubrication of the rotor bearings. Standard equipment for the outfit includes one combination blade, a steel permanent carrying case, socket wrench, and a can of lubricant.

The poppet-type throttle valve is leak-proof and instantly cuts off the air when it is closed. The throttle has a positive safety lock which prevents accidental starting of the saw in any position, for this safety lock must be released before the throttle valve can be opened. An automatic telescoping guard mounted on ball bearings shields the 12-inch saw blade when not cutting.

Literature describing the Skilsaw Model 2127 may be secured by those interested direct from the manufacturer.

New G-E Service Shop, Warehouse in Pittsburgh

Work is now under way on a new General Electric service shop and warehouse in the East Liberty District of Pittsburgh, Penna., which will house the company's facilities now located in the Terminal Warehouse. The two-story structure of steel and brick will have a 156-foot frontage on Penn Avenue and will be 153 feet deep. It is expected that the building will be completed next January.

**Guaranteed
for One Year!**

**GRIFFIN
WELLPOINTS and PUMPS**

Insist on this guarantee when next ordering dewatering equipment.
THERE'S A DIFFERENCE—INVESTIGATE
GRIFFIN WELLPOINT CORP.
725 East 140th St., New York, N.Y.
Phones: MEIrose 5-7704-5

New 60-Cubic Foot Compressed Air Outfit

A new two-stage air-cooled compressor, delivering 60 cubic feet of free air a minute at 100 pounds pressure and suitable for operating rock drills, grinders, paint sprays, and similar pneumatic tools, has recently been put on the market by the Ingersoll-Rand Co., 11 Broadway, New York City. Known as the D-60, this small compressed air outfit is particularly adapted to small contracts and odd jobs, as it is compact, light in weight and easily portable.

Three types of mountings are available, all built around the same gasoline engine compressor plant. The Push-About is mounted on roller-bearing pneumatic-tired wheels, is well balanced and can easily be rolled on or off a truck. One man can handle it on the ground. A turtle-back cover protects both compressor and engine from the weather and provides a means of locking the wheels against theft.

The Deluxe model is a spring-

mounted high-speed trailer unit with tool boxes for carrying equipment built into the side of the body. The Utility model is mounted on a steel base and can be mounted directly on a service truck or built into the body. Electric starting is available on these two models.

A new 6-page illustrated folder, Form 2688, describing these compressor models and listing the types and number of air tools which can be operated by the D-60 may be secured direct from Ingersoll-Rand by mentioning this magazine.

Coffing Hoist Moves Into New Buildings

Announcement has been made by the Coffing Hoist Co. of Danville, Ill., that it has recently moved into its new factory and office buildings. This company, which started in 1928 to manufacture a ratchet lever hoist in a small shop 16 x 18 feet in size, has since then had to move twice to larger quarters, once in 1930 and again in 1940.

In addition to the ratchet lever hoist,

the Coffing Hoist Co. also makes the Quik-Lift electric hoist, the Power Master gravity lowering hoist, a two-gear cam-actuated chain hoist, and a number of utility maintenance tools.

Folder on Stone Spreaders

The Buckeye Traction Ditcher Co., Findlay, Ohio, has available a new catalog devoted to the Buckeye spreader which, according to the manufacturer, puts material right where you want it with accuracy and uniformity and does it at minimum cost. It spreads anything from sand to a 1½-inch layer of stone independent of the truck except for motive power and a supply of material, and does away with the need for raking and brooming, cleaning up of edges and filling in low spots, the manufacturer states. Complete construction details are given in this catalog along with specifications, remarks from users, and action photographs.

Copies may be obtained direct from the manufacturer.

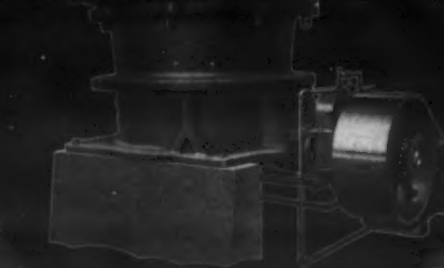
Modern Aggregate Plants... by TELSMITH

Like hundreds of TelSmith plants all over the world, these new rock crushing and gravel washing plants have operated smoothly, efficiently and profitably right from the start. A TelSmith plant means the latest in equipment—crushers to bin gates—TelSmith-designed-and-built for extra staying power, greater flexibility and capacity, lower operating and upkeep costs. And TelSmith Balanced Engineering Service and centralized responsibility fits that plant to your own particular needs.

Write for Bulletin EP-34

Pontiac Stone Co.
Pontiac, Ill.Crystal Concrete Products Co.
Braintree, Mass.Arundel Corporation, Woodberry
Quarry, Baltimore, Md.Arlington Stone
Company
Leesburg, Va.Richmond Sand
& Gravel Co.
Richmond, Va.Kelly Run Stone Co.
Wilkes Barre, Pa.Highspire
Sand & Gravel Co.
Highspire, Pa.Kentucky Stone Co.
Irvington, Ky. plant

TELSMITH PRIMARY BREAKER



Touring the Turnpike Across Pennsylvania

The Editor Travels Over The Keystone State's New Super-Highway Before and After Its Opening

(Photos on pages 22 and 23)

† THROUGH the courtesy of Samuel W. Marshall, Chief Engineer, Pennsylvania Turnpike Commission, we made a complete trip over the 160 miles of the Turnpike from Irwin, at the west end, to Middlesex at the east end just a few days prior to its official opening. Then three weeks after its opening to the public on October 1, 1940, we retraced our tracks from Middlesex west.

The notes and comments included in this discussion are the impressions gained in traveling at moderate speeds and, on our first trip, with frequent stops on this highway which is expected to perform such a great public service to motorists and motor transportation through the Commonwealth of Pennsylvania.

The Start of the Journey

Traveling east, within 1/2 mile from Irwin one passes under the first of the 87 flat-arch structures which permit local traffic to cross the Turnpike without interference to toll traffic. In the length of this new highway, traffic is carried beneath it by 75 structures, and streams of various proportions are crossed by 145 other structures, ranging from a small culvert to the majestic New Stanton Viaduct.

In traveling the first 2 miles, one is impressed with the smoothness of the highway, and also with the fact that the dividing strip in the center offers little as a barrier between opposing traffic. If the Turnpike is to continue as an unlimited-speed motorway, with all kinds of drivers behind the wheels of cars, we feel that eventually some sturdy physical barrier will be necessary in the center of the grass plot dividing the two concrete 22-foot pavements in each direction. The first fatal accident occurred on Sunday, October 20, just 20 days after the opening. This, however, was not caused by lack of a barrier between the opposing lanes.

We were also impressed by the generous use of metal plate guard rail at all points where there is any hazard from steep slopes on fills. There are many miles of this type of Empire guard rail in the length of the Turnpike, mounted on 37,707 Bethlehem steel posts. All of these posts are 4 x 4-inch H-section type 5 feet 7 inches long, except for the anchorage posts of 6 x 6-inch H-section 6 feet 7 inches long.

It was evident that every effort was being expended, during the last few days before the opening, toward making the highway safe and long-lived, as we noted gangs of men with asphalt pouring pots refilling joints which were low, and right here we should like to comment on the excellence of the crushed shale shoulders which have been brought

to a well-compacted surface, level with the edge of the pavement so that it is scarcely noticeable if one drives onto the shoulder and then back onto the pavement.

Several of the old offices of resident engineers for the various projects were converted into temporary storage for the numerous signs which were installed prior to the opening to warn traffic of the approach to the toll houses at the ends and of the various traffic interchanges where one may leave or enter the Turnpike.

Just west of the New Stanton Viaduct is the first of these traffic interchanges, with sodium-vapor lights to insure adequate illumination. Similar lighting has been installed at each tunnel approach to serve as warning of reduced speed

zones. The balance of the Turnpike has no lighting whatsoever, depending on the headlights of the cars and reflector buttons at both sides and in the center strip to serve as guides to traffic.

Just 32.55 miles from the start of the journey we reach the first of the tunnels, Laurel Hill. Just beyond, some slight wash was noted on the shoulders which was being repaired by the addition of more crushed stone. The slopes, in both rock and earth throughout the Turnpike, were in unusually good condition considering the heavy rains which occurred during the spring and which were notorious for the delays caused in paving. The cuts also were in good condition in this section, there being no evidence of slips or wash in rock.

The right-of-way fence is a continuous heavy wire mesh from end to end, raised from 4 to 7 feet in certain sections by the use of higher posts, single and double strands of barbed wire and an angle at the top, common to the "burglar-proof" type of fence. On earth fills, where the highway is on a grade, cre-

osoted board curbing has been installed just inside the guard rail posts, with galvanized iron spillways composed of a rectangular funnel leading into a short section of corrugated pipe.

Miscellaneous items of interest in the first 23 miles, just prior to the opening of the Turnpike, included a number of power grinders at work taking out high spots in the concrete which was laid at such high speed, and the fact that one gets some of the most beautiful views which can be found in Pennsylvania.

We heard one friend remark, "The Turnpike may be all right but I shall certainly miss the marvelous views from U. S. 30." If one considers the views as those advertised from some of the commercial towers erected along the route where one can see "seventeen counties and five states," then our friend will miss the view, but the sweeping vistas from the Turnpike of what amounts to a great forest park, meadows and winding streams, with the mountains all around, produce a series of scenic views that

(Continued on page 16)



BRIGGS & STRATTON GASOLINE MOTORS AVAILABLE IN A WIDE RANGE OF TYPES AND POWER OUTPUT

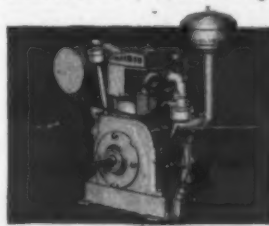
MODERN machines and equipment demand power equally as modern. Be sure of such power — choose Briggs & Stratton air-cooled gasoline motors — soundly designed, ruggedly built, and capable of the kind of performance that builds the reputation of manufacturer and dealer.

Their dependability, economy, easy starting and trouble-free operation under all conditions of service have made them famous as preferred power—Briggs & Stratton motors

are specified by more manufacturers—are found on a greater variety of equipment—than any other make. There is tangible extra value in machines, tools and appliances equipped with power that's preferred for all home, farm and industrial applications.

Look to Briggs & Stratton—the best known name in small gasoline motors for every field—every purpose.

BRIGGS & STRATTON CORP.
MILWAUKEE, WISCONSIN, U. S. A.



SAND'S-STEVEN'S Line & Surface LEVEL



Endorsed and Adopted by Road Builders and Contractors

Level is easily and quickly attached to line. Special feature construction prevents accidental detachment from line. Construction is sturdy, and accuracy guaranteed.

SAND'S LEVEL & TOOL CO.
6821 Gratiot Ave. Detroit, Mich.



A new executive file for contractors' and engineers' offices.

New Automatic File And Index Cabinet

An automatic executive file in combination with the personal efficiency set, made by the Automatic File & Index Co., 629 W. Washington Blvd., Chicago, Ill., is particularly suited for the requirements of contractors' offices, state and county highway engineers' offices, and resident engineers' and field offices. The unit conforms to desk height and when open exposes the entire contents of the upper compartment. Papers can be read easily without removal from the file because of the V opening provided by the automatic expanding and compressing feature.

The bottom drawer is mounted on ball-bearing progressive suspension slides and also has the exclusive expanding and compressing feature which gives 9 inches of extra working space. The unit is mounted on rubber-tired casters. By closing the top and turning the key, the complete unit is instantly locked and all records are safe.

Further information on these filing units may be secured by interested contractors and state and county highway departments direct from the manufacturer by mentioning this item.

Wrecking Job Tests Concrete Durability

Although still in good condition, the chimney at the Universal Atlas Cement Co. plant at Hudson, N. Y., had to be removed recently to make room for further additions and improvements to this plant which has been almost entirely rebuilt. The chimney was almost completely surrounded by buildings and other structures and there was only one way for it to fall without damaging some structure.

The base of this chimney was 22 x 22 feet x 34 feet high and the concrete reinforced stack was 200 feet high, 19 feet 6 inches in diameter at the base and 12 feet 10 inches at the top. There were 300 yards of concrete in the stack which weighed 600 tons. Holes were drilled near the bottom of the stack and loaded with dynamite which brought it down.

The chimney fell with almost mathematical accuracy. It is reported that if there had been a stake 200 feet from the base of the chimney to mark the spot where it should fall, the chimney would have driven the stake into the ground. The chimney fell as one piece, with only one transverse crack in the middle until it hit the ground.

To all outward appearances the concrete was in excellent condition, although the chimney was erected 31 years ago. The steel reinforcing bars showed no deterioration, indicating that moisture had not penetrated the concrete. The large rods were not broken in the fall, except at places where the rods were spliced. Tests have been made of this

concrete to compare the cement and methods used 30 years ago with those of today.

The wrecking contractor for this job was the Lipsett Wrecking & Salvage Corp., of Jamestown, N. Y., and Stephen J. Ryan of Norristown, Penna., was the engineer in charge of the blasting.

New Bucket Catalog Has Performance Data Tables

Culminating a three-year program of bucket redesign and standardization, the Blaw-Knox Co., Pittsburgh, Penna., has prepared a comprehensive 36-page catalog on its series of two-line lever-arm clamshell buckets. A total of 242 individual bucket specifications are involved, planned with a systematic relationship between units, and the complete series accommodates operating conditions in a wide field of service.

The 242 buckets are listed in a consolidated table according to rated capacity, ranging from 1/3 to 7 1/2 cubic yards. This table records the service

classification of each bucket, dimensions and physical data, and gives in many cases the approximate cubic-foot performance in different classes of material. In addition to these and other data, the catalog contains descriptions of the buckets, a discussion on the selection of a clamshell bucket, illustrations of the features of these buckets, and a number of job photos.

Copies of this catalog, No. 1757, and of the recently issued "Buckets for Single Drum Hoists," No. 1696, may be secured direct from the manufacturer.

New Shovel Dealers

The Link-Belt Speeder Corp., Chicago, Ill., has announced the appointment of several new distributors for Speeder and Speed-o-Matic shovels, draglines and cranes in sizes ranging from 3/8 to 3 cubic yards. These new dealers are the Tulsa Machinery Co., Tulsa, Okla.; the J. W. Patterson Co., Pittsburgh, Pa.; and the General Supply & Equipment Co., Baltimore, Md.

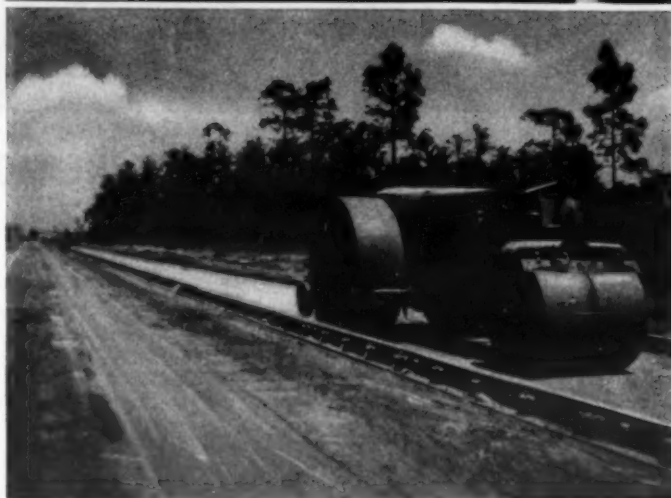


SINCLAIR REFINERIES are leaders in the development of specialized lubricants for the exacting requirements of modern equipment. For road building machinery...

... **SINCLAIR OPALINE and SINCLAIR PENNSYLVANIA** motor oils and other Sinclair lubricants promote continuous operation and low maintenance costs under the toughest operating conditions. No matter what make or type of construction machinery you operate, you can get a Sinclair oil, grease or fuel that meets manufacturers' recommendations. Some 2,000 Sinclair agents in 41 states offer you reliable delivery service on all Sinclair lubricants or fuels. Just write the nearest Sinclair office or Sinclair Refining Company, 630 Fifth Avenue, New York, N. Y.

(left) **CONE BROS. CONTRACTING CO.** (Tampa, Fla.) uses Sinclair products exclusively. Photo shows paving operation on Federal Highway from Taft (Fla.) to Osceola County line.

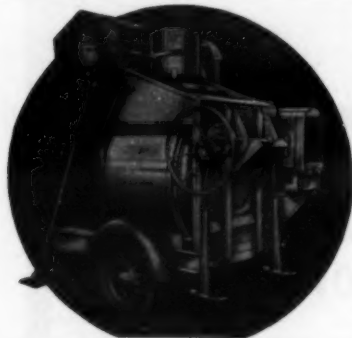
Write for "The Service Factor", a free publication devoted to solution of lubrication problems.



SINCLAIR LUBRICANTS-FUELS

SINCLAIR REFINING COMPANY (Inc.)

2540 W. CERMAK RD. CHICAGO • 10 W. 51ST ST. NEW YORK • 1907 GRAND AVE. KANSAS CITY • 573 W. PEACHTREE ST. ATLANTA • FAIR BUILDING, FT. WORTH



Demand These Features in Your MIXER!

- AUTOMOTIVE-TYPE TRANSMISSION, 30% to 40% more efficient, quieter, longer lived.
- HIGH CARBON MACHINED STEEL DRUM TRACKS, on chilled, ground rollers.

• 55 TO 145 ALIKE IN ALL BUT SIZE—real heavy duty service in light, fast, and discharge trailers with 2 or 4-wheel mounting interchangeable. Jaeger Criss-Cross "Re"-Mix Drum, Skip Shaker Loader, fastest "Pressure" Discharge—features that have made Jaeger the world's biggest selling line.

3 1/2" with Measuring Batch Hopper Mixes Sand today for new catalog to 40% More! log and prices.

THE JAEGER MACHINE CO.
701 Dublin Ave., Columbus, Ohio

Asphalt Mixtures in Bases**For Highways and Airports**

An interesting and valuable collection of facts, figures, blueprints and illustrations on highways and airports has been gathered together from all over the United States by W. R. Macatee, Washington, D. C., District Engineer of The Asphalt Institute, and published in booklet form by The Simplicity System Co., Chattanooga, Tenn., as a contribution to the road-construction industry.

Based on a cross section of actual results obtained in all parts of the country, this spiral-bound booklet covers

such subjects as the saving in costs of bases by the stabilization of the sub-grade; the trend to asphalt bases over stabilized sub-bases; the change in impact on highways and airports due to large balloon tires; asphalt mixtures for different purposes used by different states and different airports, given in detail with cross-section views of highways and runways; and illustrations, charts and blueprints to illustrate the various points.

Copies of this booklet "Asphaltic Mixtures in Bases" may be secured without obligation by interested state, county and town engineers and contractors by

writing direct to The Simplicity System Co., and mentioning this magazine.

Cost Finding Record**For Conveyor Belts**

Long a leader in the effort to have consumers keep a careful record of costs on conveyor belting in use, the B. F. Goodrich Co., Akron, Ohio, has just published a new edition of "Cost Finding Record for Conveyor Belts." The volume contains 12 record sheets of two pages each, sufficient to keep a complete record on 12 conveyor belts for six years, with tonnage records for each month on each

belt.

The sheets provide listing of all essential information on the belt, including make, brand, duck weight, length, width, number of plies, type of joint, lacings used, date received and installed, date removed, time in use, cost of repairs, total tonnage handled, and the cost per ton. Space is also provided for a maintenance record and every other important factor that goes into a conveyor belting problem.

Copies of this record book may be obtained by those interested direct from the manufacturer by mentioning this magazine.

STANDARDIZE-SIMPLIFY and SAVE

... WITH "CATERPILLAR" DIESEL EQUIPMENT



THERE are good reasons why so many successful contractors find that it pays to standardize on "Caterpillar" Diesel power-equipment.

Here's one, by E. J. Fraser, superintendent for the McCarthy Improvement Co., of Davenport, Iowa: "By standardizing on 'Caterpillar' Diesels, we have gone a long way toward simplifying servicing and operation. Our operators and mechanics are equally at home on any machine on the job."

With mechanics who know how to keep all machines in good working condition, and operators who know how to get the most work-per-hour out of them, Mr. Fraser finds that "we have stepped up our production and shortened our down-time."

But that isn't all. Mr. Fraser adds: "And . . . our experience has proved that 'Caterpillar' Diesels need less servicing and can be serviced quicker than other machines. Parts and service facilities are always handy wherever we go."

In other words, when you *do* need parts or service, nothing could be more simple or convenient than getting *all* such requirements — for *all* your power — from *one* nearby source! ("Caterpillar" parts-and-service facilities are the most complete and widespread of their kind in the world.) Fuel supply, too, becomes a simplified matter . . . one kind, one grade, one source can fill *all* your needs when "Caterpillar" Diesel powers "the whole works."

Let your "Caterpillar" dealer show you the complete present-day "Caterpillar" Diesel line. Explain your requirements and let him help you pick out the outfits best suited for *your* jobs. Or, write us direct.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

AN ALL-AROUND MACHINE FOR ALL AROUND THE JOB!

Fast, efficient, versatile, economical and dependable. That's the "Caterpillar" Diesel Motor Grader — and you'll probably use it more than any other machine you own! For maintaining haul-roads, making cuts and fills, finishing work, and general, all-around utility. E. J. Fraser writes: "We have used our 'Caterpillar' Diesel No. 12 Motor Grader as a supplementary and finishing unit on various jobs in the last two years, and believe that this machine is the most outstanding, all-around, time-and-money-saving machine available today."

If you want to see pay-dirt fly, watch an outfit like this at work: A "Caterpillar" Diesel D8 Tractor with a LeTourneau Carryall Scraper. This is one of nine "Caterpillar" Diesel Tractors — along with the "Caterpillar" Diesel No. 12 Motor Grader shown in the above photograph — used by the McCarthy Improvement Co. on the relocation of Highway 66 near Bloomington, Illinois.



CATERPILLAR

DIESEL ENGINES AND ELECTRIC SETS

TRACK-TYPE TRACTORS • ROAD MACHINERY

Rockefeller Highway Improved by Planting

Interest of Citizens Results in Many Contributions of Shrubs and Trees; Native Plants Used, and New Jersey Route Is Greatly Improved

(Photos on page 4)

AN interesting roadside-development project was inaugurated last spring by the New Jersey State Highway Department along the Rockefeller Memorial Highway. The section where this work has been done extends for 8 miles on Route 40 in Burlington County easterly from the junction with the Route S-40 traffic circle. It is expected that a distance of 20 miles will have been completed by next summer.

This highway, including Routes 35 and 40 from the Shark River in Monmouth County to the King's highway circle in Camden County, 60 miles away, has been designated, by vote of the New Jersey Legislature in 1938, as the John Davison Rockefeller Memorial Highway, in tribute to an outstanding New Jersey citizen. The route leads to many of Jersey's shore resorts.

Improvement Project

The improvement of the appearance of the roadside along this highway aroused considerable interest among property owners along the route, with the result that they contributed some of their finest trees for transplanting, and the Rockefeller family also responded generously, donating hundreds of pine trees from their Lakewood Estate. In order to produce the best results, and in accordance with the best roadside-development practice, only native plants have been used.

Among the trees which have been planted along the route in the completed 8-mile section are more than 30 pin oaks 6 inches in diameter and more than 150 oaks 3 inches in diameter. Other varieties include about 100 birch and dogwood trees, 1,000 laurel plants and 100 American holly.

Although the actual planting is the most spectacular phase of roadside development and the one which makes an immediate impression upon the motoring public, there were many other phases of the work before this took place. All slopes were widened and flattened to 4 to 1; sand banks were cleared out, sloped back and stabilized with gravel or top soil; the native growth was cleared out judiciously, and grass was planted on the bare slopes.

Work was carried on by the New Jersey State Highway Department forces, with assistance from the Department of Conservation and Development, the CCC and the WPA.

According to a recent statement by State Highway Commissioner E. Donald Sterner, only a few thousand dollars of highway funds have been expended for extra truck hire and equipment and the acquisition of adjacent low-priced highway frontage through the pine forest areas from the local townships through tax title liens, in order to provide a maximum space of 200 feet on each side of the roadway.

The landscaping takes full advantage of ponds and streams which border the highway, rustic bridges and railings are being erected in accordance with parkway design, and occasional slopes have been planted with grass. Picnic areas, with drive-ins, will be provided.

Deck-Type Trailers

Fruehauf 30, 35 and 40-ton Carryall trailers are obtainable in either the semi or full-trailer type. Sixteen wheels placed in two rows at the rear of the trailer give ample support for its rated



C. & E. M. Photo
A completed portion of the roadside development project on Rockefeller Memorial Highway in New Jersey, showing the clearing and a good stand of grass.

capacity, and standard equipment includes three heavy-duty type lashing rings on each side, skid rail on the rear, hardwood platform, lights to meet local

state laws, Fruehauf special Carryall brakes with air or vacuum power and with 360-degree slack adjusters. Among its features, according to the manufac-

turer, are alloy and pressed steel construction for light weight with maximum safety, and easy servicing as all parts are readily removable.

Complete information, including specifications and illustrations, may be obtained direct from the Fruehauf Trailer Co., Detroit, Mich., by mentioning this item.

Streamlined Arc Welder

The new Streamliner Junior gas-engine-driven arc welder which is fully described in a bulletin recently issued by Hobart Brothers Co., Box CE, Troy, Ohio, is a sturdy yet compact unit, well protected from the weather. Equipped with an engine of 132.7-cubic inch displacement, it gives the power necessary to insure full welding capacity at the normal economical operating speed of 1,500 rpm.

Those interested may obtain a copy of this bulletin direct from the manufacturer who also offers the use of the welder on 30-day trial.

6,779 LINEAL FEET OF TUNNEL.



Samuel R. Rosoff, Ltd., holds the largest mileage contract . . . 14.7 miles . . . on the Delaware Aqueduct, world's longest tunnel job. The Rosoff shafts are the deepest, ranging in depth from 825 feet to 1,551 feet. The progress is all the more

remarkable when we consider the anticipated difficulties encountered . . . very hard rock in a large part of the tunnel . . . "popping" rock . . . methane gas which required the development of a fire hose system.

CHICAGO PNEUMATIC

GENERAL OFFICES: 6 EAST 44th STREET, NEW YORK, N. Y.

Utility Ditcher For Fast Digging

The new Model 16-S utility trenching machine recently announced by the Buckeye Traction Ditcher Co., Findlay, Ohio, is mounted on and powered by a standard 1½-ton truck with dual tandem rear wheels. The rotary wheel excavator digs to a depth of 5½ feet, cutting a clean trench up to 22 inches wide. The spoil or material that has been dug can be discharged to either side of the machine. The 16-S follows any line, straight or curved, digs up and down steep grades and excavates gumbo, hardpan, impacted gravel or anything short of rock, the manufacturer states.

Power from the specially built transmission is delivered to the excavating wheel through the patented constant-center drive. The excavator wheel is hoisted clear of the ground when the truck is being made ready to move to a new location. With the digging wheel in raised position, the overall height is only 11 feet, providing ample clearance for



The new Model 16-S Buckeye utility trenching machine.

viaducts, underpasses and bridges.

It is reported that even in tough soils speeds up to 10 feet a minute are obtained. One man at the controls just back of the truck cab can dig from 2,000 to 5,000 linear feet of trench a day, depending on soil conditions. Trenches to

accommodate 4, 6, 8, 10, 12 or 16-inch pipe can be excavated.

Summer or winter, lubrication is important. Have you any winter lubrication problems? If so, the Editor will be glad to help you.

AND STEEL SUPPORT

in 31 consecutive working days



Operating Staff, Samuel R. Rosoff, Ltd.:

David E. Stinson, General Master Mechanic;
James Fisher, General Superintendent;
Philip S. Miller, First Assistant Engineer;
Fred W. Stiefel, Chief Engineer;
Arthur H. Diamant, Vice President;
W. Quick, Superintendent, Shaft No. 2-A;
Walter Dunham, Superintendent, Shaft No. 3;
L. S. Penland, Superintendent, Shaft No. 2.

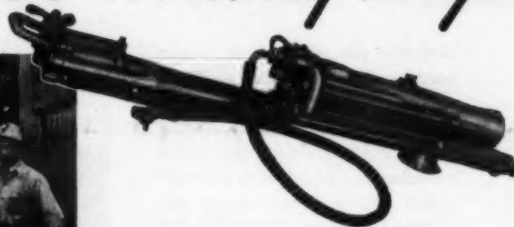
Samuel R. Rosoff, Ltd., is setting new progress records on the Delaware Aqueduct, New York.

Here are some typical figures:

At Shafts Nos. 2, 2-A and 3; six headings; 6,779 lineal feet of tunnel were driven in 31 consecutive working days, with steel support directly to the face of each heading, using crown bars.

3,760,000 pounds of structural support were erected in the same period; 176,200 feet board measure of timber were used.

This is equivalent to driving 10,075 lineal feet of unsupported tunnel for the same period, 31 consecutive working days.



This is the CP MOTORdrifter which is helping Rosoff crews to outstanding performance on the Delaware Aqueduct.



Board of Water Supply Inspectors:

John G. Mergott Max F. Freund
Roderick C. St. Leger Arthur E. Hilliard
Francis J. Colgan John Horn

The actual value of the work performed during this period was \$1,117,987.00.

CP-60 Drifters were used exclusively in drilling this footage.

For complete data on the CP-60 MOTORdrifters which are giving such outstanding performance on the world's longest tunnel job, send for copy of Catalog No. 600, "CP Contractors' Equipment".

Special Falsework On Viaduct Span

Big Saving in Timber on Falsework of Mt. Sterling Viaduct by Clamping Eight I-Beams to Columns

† A NEW 549-foot concrete viaduct with a 24-foot roadway and one 4½-foot sidewalk has recently been completed at Mt. Sterling, Ky., by A. W. Walker & Sons of Danville, Ky. The structure, designed by the Bridge Division of the Kentucky Department of Highways, is remarkable in that, by spanning four tracks of the C & O railroad at one point, it actually does away with four grade crossings and will be no small factor in developing a new residential section of the city which had been retarded in growth by the grade crossings necessary to reach it.

From the construction standpoint the structure is remarkable for the economy effected in the use of timber and lumber falsework beneath the high concrete decks. In one span 37 feet average above the sloping surface of the ground, the cost of the heavy I-beams to carry the forms for the deck was almost absorbed by the saving in labor and materials which would have been used in the elaborate falsework that would have been required otherwise. Instead of building up the falsework from the ground, the contractor used eight 16-inch 48-pound wide flange I-beams 37 feet 6 inches long supported by clamps of 12 x 12 timber around the two columns at each bent. The clamps, actually holding the 12 x 12's, consisted of two Universal clamps and one bolt on each side of each column. Beneath these clamps, as an added factor of safety, were six posts of saplings.

The deck forms were built up from the I-beams with 8 feet clear between the temporary plank deck laid on the I-beams for the carpenters to the bottom of the deck forms proper. The deck forms were supported by timber posts on 12 x 12-inch sills.

Personnel

Credit for this economy in falsework goes to A. E. Walker, Contractor, Harry E. Meyers, Superintendent, and Leo Thread, Head Carpenter for A. W. Walker & Sons, on this FAGM project. J. C. Crawford was Resident Engineer for the Kentucky Department of Highways on this work.

Electric Heat Aids Unloading Asphalt

Electric heat is used to maintain a free flow of asphalt through 600 feet of unloading pipe at the Byerlite Corp.'s plant in Cleveland, Ohio. Calrod heating units wound spirally around the 2½-inch pipe maintain a free flowing temperature of around 400 degrees F. One of the advantages claimed for the use of electric heat is that it eliminates the possibility of moisture in the asphalt.

These General Electric Calrod units are spiralled in approximately 2½-foot spirals along the 600 feet of pipe. A sheet metal covering gives a uniform temperature to the line and eliminates hot spots, and finally there is an ample covering of heat-insulating material. Thermostats control the heaters automatically, and a series-parallel connection of the heating elements provides flexibility.

Further information on these electric heating units for asphalt unloading setups may be secured by contractors and state and county highway engineers direct from the manufacturer by mentioning this item.

TOOL COMPANY

SALES OFFICES AND SERVICE STATIONS THROUGHOUT THE WORLD



C. & E. M. Photo
A pair of I-R wagon drills operated by Sammons, Robertson, Henry, the subcontractor on rock work.

Rock Work Subbed On Flood-Control Dam

(Continued from page 2)

summer led the contractor to install a 1,000-gallon tank truck for sprinkling the road regularly during dry weather.

Rock Excavation

As all of the heavy rock excavation is along the west bank of the river, the subcontractor for rock work, Sammons, Robertson, Henry, of Huntington, W. Va., set up its compressor plant and shops near the old location of U.S. 3A which has been relocated around the spillway cut. The compressor house contains two Ingersoll-Rand Imperial Type 10 compressors, one of 600-cubic foot capacity driven by a 75-hp Westinghouse motor and the other a 1,200-cubic foot unit driven by a 200-hp Allis-Chalmers motor. In addition a portable Ingersoll-Rand 315 is installed outside the drill steel shop to operate the I-R drill sharpener. Bethlehem drill steel in lengths up to 22 feet is being used on this job with no detachable bits. Eight Ingersoll-Rand wagon drills and four I-R jackhammers are being used with air from the stationary plant for all drilling. The rock is being loaded out by two Lima 101 shovels of 1½-yard capacity, with a Caterpillar D7 equipped with a LaPlant-Choate bulldozer pushing the rock into position to speed the work of the shovels. Three Athey crawler wagons hauled by Caterpillar D8 tractors and two of the contractor's own trucks and two or three hired trucks are used to move the rock from the shovels. Holes up to 20 feet deep are fired with du Pont 50 per

cent dynamite. The rock on the west side of the river is full of mud seams, making it very difficult to shoot satisfactorily without block-holing.

In order to supply water to the men around the office and close by, this contractor has a 500-gallon wood water tank mounted on four wheels which is towed in to Franklin and filled with city water. Attached to the end where the men may draw off water for drinking is a MSA salt tablet dispenser for use in the hot weather.

Along the east side of the stilling basin excavation is a bank of unstable material which the general contractor has held in position, after several slides, by the use of an installation of More-trench wellpoints. The bottom of the stilling basin will be of concrete on ledge at an elevation of about 25 feet below normal river level, and then up the sides. One and ½ feet of riprap on 8 inches of gravel is being laid to check erosion. At the toe of this riprap and across the bottom where not on ledge, 2 feet of derrick stone which may weigh

from 500 to 10,000 pounds each is laid.

Processing Sand and Gravel

The general contractor erected what is believed to be the largest sand and gravel processing plant east of the Mississippi River, high on the east bank of the river. In the early stages the various sizes of gravel nominally referred to as 1-inch and 2-inch but embracing the sizes from ¾-inch to 1-inch and 1-inch to 2-inch respectively, were permitted to flow together at the final bins and were immediately hauled by truck for gravel drains and other similar work. The plant as described here is the final plant which produces the screened and washed gravel and sand suitable for concrete work.

A Link-Belt 1½-yard shovel loads to two Streich 10-yard trailer wagons hauled by Oshkosh truck tractors which shuttle between the pit and the dump over the grizzly. The bottom-dump trailers are driven across two 18-inch H-beams placed as tracks over the hopper. The grizzly consists of light rails

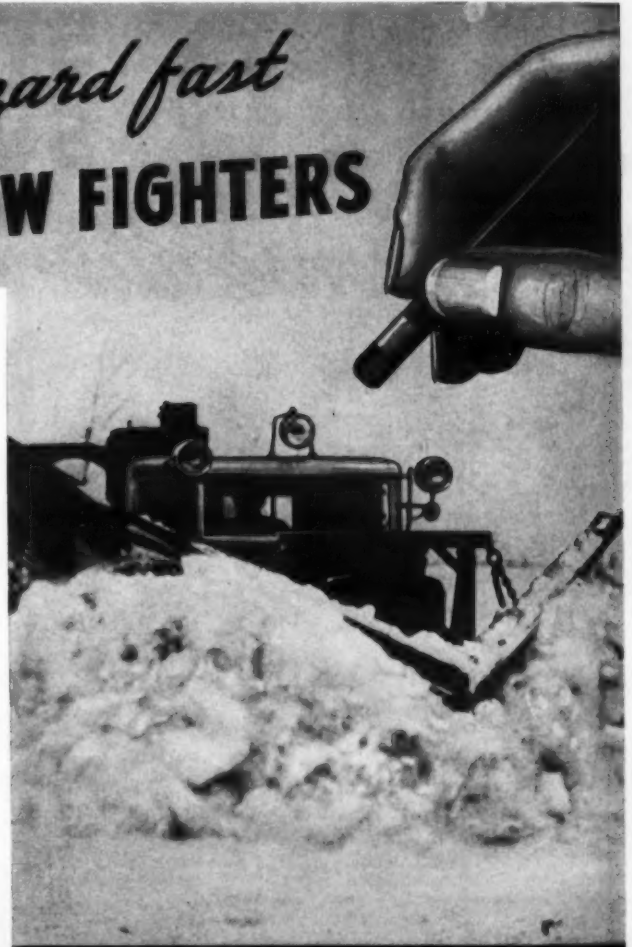
spaced 14 inches on center to remove only the largest stone. A derrick built of pipe was set up beside the hopper and is operated by a hand winch for picking large rock off the grizzly. The flow of material from the dumping hopper is controlled by a sluice gate operated by a man who keeps the feeder belt filled so that the plant can produce its design capacity of 100 tons of processed material per hour. The entire plant was designed by Kennedy-Van Saun Mfg. & Engg. Co., with Westinghouse motors for powering all equipment.

The feeder belt carrying the material from the dumping hopper to the gyratory crusher is 58 feet long and 30 inches wide driven by a 50-hp motor. This delivers the materials over a 2-inch vibrating scalping screen, the larger material going direct to a No. 14 gyratory crusher which discharges on to the same main conveyor belt as the material passing the 2-inch screen. The main conveyor belt is 130 feet long

(Continued on page 30)

Erase the blizzard fast with WALTER SNOW FIGHTERS

Undoing the mischief of a blizzard on the highways calls for snow removal trucks especially designed for such work. Walter Snow Fighters are the only vehicles equipped with a differential action that insures adequate traction for heavy snow removal. Walter patented automatic lock differentials combined with suspended double reduction drive, tractor type transmission and other features, provide traction that makes WALTER SNOW FIGHTERS "tops" in snow removal equipment. Most road officials who have equipped their departments with Walter Snow Fighters are convinced that they can move more snow faster at lower cost with a Walter Snow Fighter than by any other means.



WALTER MOTOR TRUCK CO.
1001-15 IRVING AVENUE, RIDGEWOOD, QUEENS, L. I., N. Y.

**THE STRONGEST
GEARED
POWER
FOR ITS
WEIGHT
IN THE
WORLD**

BEEBE BROS.
SEATTLE, U.S.A.

COMPACT—POWERFUL—SAFE
"For use where power is not practical or available"
Manufactured in 2, 5 and 15-Ton Sizes.
For capacity comparison, ½" cable used:
2-Ton "Lightweight" 75 ft.
5-Ton "General Utility" 250 ft.
15-Ton Triple-Geared "Special" 1200 ft.
Patent instant gear change and positive
internal brake that never fails, and will
lock load.

Gear Ratio	Weight	Price, f.o.b. Seattle
2-Ton 4 & 22 to 1	60 lb.	\$ 50
5-Ton 4 & 24 to 1	110 lb.	\$ 75
15-Ton 4, 19 & 109 to 1	680 lb.	\$250

BEEBE BROS.
2724 6th Ave., So., SEATTLE, WASH.
Warehouse stocks for dealers' supply: Seattle—
Chicago—Brooklyn—Houston. Complete literature
and List of Dealers in Principal U. S. Cities and Foreign Countries Gladly Mailed.

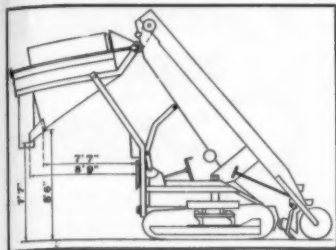


Diagram showing a rotary screen on a Nelson Q-7 loader.

New Rotary Screen For Sand and Gravel

Low-cost equipment for working mixed sand and gravel deposits, separating the mixture into usable sand and usable gravel for road construction and maintenance, is made by the N. P. Nelson Iron Works, Inc., Passaic, N. J. This outfit consists of a Nelson rotary screen working in conjunction with a Nelson Series Q loader, and is especially adapted to properties of small to medium size, with an output of 40 to 500 cubic yards a day.

In one operation and with one operator, this mobile crawler-mounted outfit digs from the bank, screens, and delivers either sand or gravel to the truck. There are no large bins or long conveyors; the plant is reduced to its simplest elements and moves by its own power from point to point in the pit as required.

The screen may be mounted on either a Q-3, Q-4 or Q-7 loader by removing the swivel spout and hanging the unit from the head of the boom. Struts to the front of the chassis support its weight, while a chain drive from the elevator head shaft revolves the screen. To handle unscreened material, top-soil strippings or run-of-bank, a gate is set at the screen inlet, closing off the screen and deflecting all material into the lower chute.

Further information on this screening and loading outfit for moving screened sand or gravel from pit to truck is contained in literature which interested contractors, state, county and township engineers may secure direct from the manufacturer by mentioning this magazine.

New Type Form Liner For Smoother Concrete

To make concrete surfaces harder, denser, smoother and more resistant to abrasion, a new absorptive form liner board has been developed by the Celotex Corp., 919 No. Michigan Ave., Chicago, Ill. For more than a year this company has cooperated with the Bureau of Reclamation in studying, testing and improving this product which is currently being used on the Bureau of Reclamation's Friant Dam in California and by the TVA on Watts Bar Dam.

Celotex absorptive form liner is used on the inner surfaces of concrete forms and is reported to absorb air bubbles from the surface, preventing pitting and sand streaks; and to remove excess water from the concrete directly in contact with the form, thus reducing the water-cement ratio and any excess of fines, producing a smooth, hard and durable surface.

The manufacturer states that Celotex absorptive form liner produces a structural change in the concrete to a depth of 1½ inches back from the face of the form, but that the tough dense concrete produced near the surface blends with the interior so gradually that there is no plane of cleavage between the surface concrete and underlying layers. In freezing and thawing tests made by the Bureau of Reclamation, it is reported that concrete blocks cast in forms with Celotex liner showed no deterioration, whereas blocks cast in wood forms showed a 37.7 per cent loss of weight in 60 cycles of the test. In a crazing test, also made by the Bureau, concrete blocks were placed in the sun and periodically splashed with ice water. There was practically no surface crazing on the blocks cast with Celotex liner but considerable crazing in the blocks cast in wood forms.

Celotex absorptive form liner is being offered in two types. The standard product is ironed on one side to provide a smooth concrete, while a special textured



An Austin-Western 8-yard scraper operated by a TD-15 diesel TracTracTor on a New Mexico highway. This outfit is owned by the State Highway Department.

liner provides a textured concrete. Projects on which this form liner may be used include grade separation structures, bridge piers and abutments, retaining walls, piers, viaducts, precast concrete products, sedimentation basins

for water and sewage, dams and reservoirs, concrete-lined irrigation canals and lock chambers.

Further information on Celotex absorptive form liner may be secured direct from the manufacturer.

GIVE ME AMERICAN CABLE
TRU-LAY PREFORMED
Every Time—

- 1 It resists kinking
- 2 It spools better
- 3 It requires no seizing
- 4 Broken crown wires lie flat and in place
- 5 It is easier and safer to handle
- 6 It reduces unproductive shutdowns
- 7 It lasts longer—gives better service

AMERICAN CABLE
TRU-LAY *Preformed*
WIRE ROPE

"Whenever my ropes must operate over sheaves or drums... then I want American Cable's TRU-LAY Preformed. It has greater fatigue resistance; lasts longer; is easier to work."

So say thousands of operators from every industry. Nor do they say and believe that just because we insist upon it in magazine advertisements. They *know* from actual field and plant experience extending over a period of years.

Join the rapidly increasing ranks of industrial money and time savers by specifying American Cable's TRU-LAY Preformed. *All* American Cable's Wire Ropes made of Improved Plow Steel are identified with the Emerald Strand.

BUY ACCO QUALITY—whether in American Cable Division's Ropes—American Chains (Weed Tire Chains and Welded or Weldless Chains)—Campbell Abrasive Cutting Machines—Page Wire Fence—Page Welding Wire—Reading-Pratt & Cady Valves—Wright Hoists or any other of the 137 ACCO Quality Products.

AMERICAN CABLE DIVISION

WILKES-BARRE, PENNSYLVANIA

District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco

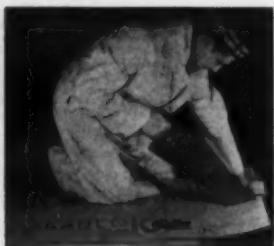
Green Signifies Full Speed Ahead for National Preparedness

AMERICAN CHAIN & CABLE COMPANY, Inc.

Contractors—Prevent loss of tools and other equipment with this EVERHOT Branding Iron

This inexpensive Branding Iron may also be used as a soldering iron or blow torch.

EVERHOT MFG. CO.
31 S. 19th St.
MAYWOOD, ILLINOIS



The new Gatke brake lining comes in sheets which are easily cut to requirements on the job.

New Woven-Moulded Brake Lining Sheets

Facility in meeting widely varying dimensions in brake lining and clutch facings with a limited stock of material is provided by the improved woven-moulded brake lining sheets announced by the Gatke Corp., 228 No. LaSalle St., Chicago, Ill. This Gatke Makablok, as this sheet stock is named, is tightly woven of selected long-fibre asbestos yarn and soft alloy wire, saturated with a high-heat-resisting frictional compound by a special process, compressed to great density and surface ground to uniform thickness.

From a sheet of correct thickness, brake liners and clutch facings can be sawed quickly and accurately to the required size. The material readily conforms to any drum diameter and can be used for either internal or external-type brakes. It can also be used for the cone type, as well as for disc clutch facings. Gatke Makablok is furnished in rolled sheets 20 inches wide x 5 feet long, in $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ -inch thicknesses.

Weather Insurance For Machines, Jobs

Mark Twain once said, "Everyone talks about the weather but no one ever does anything about it." Contractors have long ago found out that there isn't much they can do about it except "make hay while the sun shines" and grin and bear it when it doesn't. However, the H. Wenzel Tent & Duck Co., St. Louis, Mo., has recently issued a booklet "Weather Insurance" describing its products which, though they can't change the weather, are designed to offer protection against it. These Para tarpaulins are used to enclose concrete

work during cold weather as well as to protect materials and machines exposed to the elements.

Para waterproof tarpaulins have a paraffin base waterproofing which it is stated increase their waterproofing efficiency 500 per cent. The canvas used complies with U. S. government specifications, all seams are double-stitched throughout for extra strength, the hems are securely hook-stitched to prevent ripping, and rustproof grommets and eyelets are placed 5 feet apart all around, with each grommet clinched in a double thickness of canvas to prevent pulling out. In addition to resistance to water, Para materials are also treated for maximum mildew resistance and provide protection against wind and cold as well.

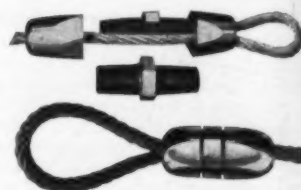
A free copy of "Weather Insurance" and of "Para Story," containing full details and specifications on the various types of tarpaulins, an explanation of buyers' practical test methods, and instructions for the selection of the proper tarpaulin for a particular purpose, may

be secured by interested contractors and engineers direct from the manufacturer by mentioning CONTRACTORS AND ENGINEERS MONTHLY.

New Wire Rope Clamp Has Safety Device

The Safe-Line wire rope clamp, made by the Safe-Line Clamp Div., National Production Co., 4561-4603 St. Jean Ave., Detroit, Mich., is featured by its double holding power, ease of assembly, and has been approved by the Underwriters' Laboratories, Inc., for use on the strongest of wire ropes.

The inner surface of the clamp which grips the wire rope is double spiral splined to fit each strand and wire of the rope, to take a secure grip on each strand. The gripping halves of the clamp are held tightly to the rope by taper threaded nuts. The clamp is made of high tensile strength steel and is guaranteed by the manufacturer to out-pull any wire rope made. Stock sizes are



Above, the parts which make up the Safe-Line wire rope clamp and, below, a completed grip.

for ropes $\frac{3}{8}$ to $\frac{3}{4}$ inch. Unlike a spliced joint or zinc-in socket, a joint made with a Safe-Line clamp can be quickly readjusted to the proper tension, and can be used over and over again. Another feature is that no sharp ends of wire protrude, thus protecting workmen's hands from injury and permitting free and safe handling of the rope.

Further information on these Safe-Line wire rope clamps is contained in literature which may be secured direct from the manufacturer by mentioning this item.

From Drilling Rigs to Car Loader

SMOOTH OPERATION



GEAR TEETH and wire rope perform quietly, economically when lubricated with a tough, wear-defying film of Texaco Crater. All trucks are fueled and lubricated exclusively with Texaco.



MAK TRUCK DUMPING into Allis-Chalmers Gyratory Crusher, the bearings of which are protected with Texaco Crusher Oil.



TEXACO MARFAK in the bearings of all belt conveyors keeps down wear, sealing out dust, dirt and rain water.

WITH NO FEWER than 64 pieces of mechanical equipment in his charge, Superintendent W. B. Couch knows the value of smooth operation . . . and gets it.

Rock drills, shovels, trucks, crushers, conveyors, bulldozers, air compressors, gears and wire rope, even the freight-car scales in this quarry are fueled and lubricated exclusively with TEXACO.

You, too, can get smooth performance from your equipment, experience less wear, lower operating and maintenance costs by using Texaco Fuels and Lubricants.

Trained lubrication engineers will gladly cooperate in making savings with Texaco Products in your equipment. Phone the nearest of more than 2300 Texaco warehousing points in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York, N. Y.



SUPT. W. B. COUCH of Campbell Limestone Co., Greenville, S. C. An enthusiastic Texaco 100-percenter.



Texaco Dealers invite you to enjoy Fred Allen in the new full-hour program of The Texaco Star Theatre . . . with Kenny Baker, Al Goodman's Orchestra and a great cast. Every Wednesday Night, Columbia Network. 9:00 E.S.T., 8:00 C.S.T., 10:00 M.S.T., 9:00 P.S.T.

TEXACO Industrial Lubricants

IT'S NO SECRET



THAT ROSS plows will move more snow and do it with less power than any other. They are scientifically designed and built to PLOW, not bulldoze snow. The "Sno-Flo" moldboards used on Ross plows pick up the snow and roll it.

Ross plows are furnished for truck and tractor mounting, with or without wings and to be operated with hand or power hydraulic.

Manufactured by

THE BURCH CORPORATION
Crestline, Ohio

Builders of Equipment for Fifty Years

Concrete Paving— But Without Pavers

**Crumley-Jones & Crumley
Used Fleet of 8 Side-Dump
Truck Mixers on Long Job
On Ohio-U.S. 52 at Utopia**

(Photos on page 44)

+UTOPIA is not limited to fame in Gilbert and Sullivan operas; it is a very real little community in southwestern Ohio, through which a new 22-foot concrete pavement was laid during the 1940 construction season. Considerable heavy grading was required but the feature of the 6.176-mile job was pouring the slab with a fleet of 3-yard side-dump Jaeger truck mixers which permitted the job to click off 1,500 feet of 11-foot slab, 9-7-7-9 inches in section, between 7 a.m. and 3 p.m. every paving day after the organization got tuned up.

The Big Batcher

Batching for the big truck mixers was well handled by the contractor even though all aggregate was hauled some 35 miles from Newtown, Ohio, to the well-protected side-hill aggregate bins. Taking advantage of a high slope on the north side of the job, at about the middle, the contractor dug a depressed roadway for the truck mixers to go under the aggregate and cement batching plants, a second runway at the proper elevation for the P & H crane, which with its 65-foot boom and Owen 1 1/4-yard clamshell bucket kept the Blaw-Knox 150-ton aggregate batching plant supplied, and a third higher roadway with a relatively low grade from the west for the loaded trucks of aggregate and a very steep grade for them to exit. The side-hill storage bins were well bulkheaded and completely lined from top to bottom with sheet metal to prevent mixing of the clean aggregate with the local soil.

The aggregate batcher was supported on 12-foot concrete piers, while the cement batcher had short footings and its own steel structure was sufficiently high to support it above the tops of the truck mixers. Both bag and bulk cement were used by the contractor. When bag cement was used, four men were kept busy at the large opening of a chute on the second level, emptying the bags so that the contents could be carried up to the storage bins above the weighing batcher by means of a bucket elevator. For a portion of the job bulk cement was used, being brought to the plant in large steel containers by trucks which carried 40 barrels.

On the operating platform of the aggregate batcher a Master vibrator was mounted so that the weigh bucket of the Heltzel bulk-cement batching plant could be vibrated to release the cement quickly from the bucket to the truck mixer. Also on the same platform a U. S. air compressor, of the garage type, was mounted to supply air to the bulk-cement plant to prevent the cement from packing.

As the slump of the mixed concrete

was held closely between 2 and 2 1/2 inches, the water for the truck mixers was batched at the aggregate plant and not by the truck drivers. A large volumetric batcher was mounted on the aggregate batching platform and automatically supplied with water from the line laid along the shoulder from a creek which crossed the job. On the bank of the creek a Jaeger triplex pump delivered the water through a 2 1/2-inch pipe line which had taps at convenient points for filling the sprinkler truck, and several taps close to the batching plant so that the truck mixers could be quickly washed out at the end of the day.

The batch weights on September 3, 1940, corrected for moisture were: 3,228 pounds of 1 1/2 to 3/4-inch stone; 3,259 pounds of 3/4 to 1/4-inch stone;



A Jaeger truck mixer delivering its batch direct to the spiral spreader on a 6.176-mile concrete paving job which was poured in unusually fast time.

3,719 pounds of sand; and 1,692 pounds of cement.

Preparing the Grade

Preliminary soil surveys were made throughout this project to determine the character of the soil and the specific sections where subgrade treatment would

be necessary. In general the soil is a heavy silty clay which readily absorbs moisture and does not dry out quickly. Wherever the classification was poor, the plans required that the poor soil be removed and replaced with a 19-inch minimum blanket course of graded

(Continued on page 38)

When These Two Columns
ADD UP...

DESIGN

CENTER DRIVE: Turntable, crawler and shovel boom are all built to the time-proved principles of Center Drive design.

BALANCED TURNABLE: Patented sloping machinery frame concentrates maximum weight to develop maximum capacities at minimum weight.

SIMPLICITY: A compact, accessible design whose fewer parts are huskier, stronger.

CONCENTRATED POWER: A direct-to-the-point application of power which can be concentrated all on one operation or spread over simultaneous ones. Gas, Diesel or electric.

MOBILITY: Two crawler speeds (and steering) in either direction. 30" wide treads available for minimum ground pressures. Travel brake.

CABLE OR CHAIN CROWD: Choice of independent Chain Crowd (illustrated) or automatic cable crowd.

VERSATILITY: Easily convertible, and equally efficient as a crane, dragline, clamshell, shovel, back-digger, skimmer-scoop.

PERFORMANCE

1200 Yds. in 10 Hours!

That's the yardage for this 3/4-yd. Lorain-40A of the Smith Construction Company. The shovel is digging and loading creek bed sand and gravel for a highway job in Lincoln County, W. Va.

And here are a few more reports from Lorain-40A owners—

2508 yds. in 13 hrs.!
1600 yds. in 12 hrs.!
1800 yds. in 12 hrs.!

Sure, these are top yardages but they show what this 3/4-yd. machine can do under pressure.

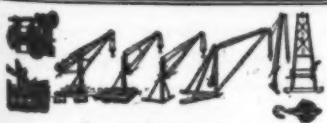
YOU'VE GOT A BUY

• The Lorain-40A is one 3/4-yd. machine that can lay both design facts and performance figures on the line to prove its ability to move more material, faster, at lower cost. The complete story may be had by writing

UNIVERSAL CRANE DIVISION • THE THEW SHOVEL COMPANY • LORAIN, OHIO



3/4-YD. LORAIN-40A



**Complete Line
of
DERRICKS
and
WINCHES**

SARGEN DERRICK CO. Chicago, Ill.
2101 W. Grand Ave.

Penna. Turnpike

(Continued from page 7)

challenge the best which now lure tourists to the far West, New England or Canada.

Between the Tunnels

The approximately 23 miles between Laurel Hill and Allegheny Tunnels is filled with bridges and underpasses, as there seems to be a considerable number of cross highways through this section which includes the Somerset Interchange.

The center strip between the roadways is graded gently to the center line of the highway on level tangents but on long down grades it is reversed and graded to a slight crown so that the water will not accumulate in the ditch and cause erosion. In places where it has a depressed section, drains are placed at frequent intervals to carry the water from the roadway.

Particular attention should be called to the manner in which the approaches to the gas stations, of which there are ten, have been handled, with long bituminous cold-mix roadways leading off at an easy angle from the main highway and approaching it again in the same manner.

Between the Somerset and Bedford Interchanges, the grade is generally slightly higher than the adjacent flat country between the mountains, which will aid greatly in keeping the highway free of snow in the winter and lessen the amount of plowing necessary, as the winds will sweep from the raised portion into the adjacent fields.

From Bedford to Eastern Terminus

The Bedford Interchange is approximately 82 miles from Irwin and about 1/2 mile east of it is the big side-hill cut and fill which required five benches.

The mountains begin to bunch up in this section of the Turnpike near Rays Hill Tunnel, approximately 98 miles from Irwin. This tunnel is the shortest of the seven tunnels on the Turnpike and has a ventilation building at the west end only. Between Rays Hill and Sideling Hill Tunnels there are few structures. Sideling Hill is one of the longest of the tunnels and so that drivers will not be discouraged, they immediately come upon a gas station on the left-hand side of the road as one leaves the tunnel.

In this section the only slip noted in any of the cuts was seen on the south side of the road and was only minor in character. Much skepticism was expressed by contractors and engineers who worked on the Turnpike, and many prophesied that the rock fills would settle badly. The winter of 1939-40, when all rock fills had been completed, was a very good test of the character of rock, subjecting it to alternate freezing and thawing and to heavy snow. From end to end of the pavement no unequal settlement was noted and there is no evidence of mud-pumping under the pavement to iron out any inequalities. If settlement does occur in the future, the faithful Mud-Jack will easily "do its stuff."

From the Bedford Interchange to Tuscarora Mountain Tunnel we noted considerable wet slope on the south side of the road but no slips. From the Fort Littleton Interchange, the motorist driving east is treated to a series of beautiful sweeping views of mountain country while approaching the west portal of Tuscarora Tunnel.

The last 40 miles of the Turnpike, from Tuscarora Tunnel, is perhaps the least interesting scenically, as the country flattens out, there are few overhead structures to break the view ahead, and with the exception of the surprise trip through Kittatinny and Blue Mountain Tunnels, with a flash of daylight between, there is really not much to stimulate the driver

aesthetically, although the long straight road ahead provides an opportunity to indulge in a speed test of his car with "the accelerator down to the floor board."

Tuscarora Tunnel, about 1.1 miles in length, is the roughest piece of riding on the entire Turnpike. Of itself it is probably not rough, but in comparison with the other 158.9 miles it seems so.

One enters Kittatinny Mountain Tunnel, flashes into sunlight for about 0.2 mile and then immediately enters Blue Mountain Tunnel. We thought that on very brilliant days this short period of sunlight might be a severe test of the intensity of the lighting and its effectiveness in the first 150 feet of each of these tunnels, east and west, but on our second trip on an ideal brilliant October day we found no difficulty in the quick change from tunnel lighting to daylight and back to the mercury lights again.

Speeds

During the 40 minutes we were held up at the Bedford Interchange on our

first trip, while the 16 miles ahead was being used for some speed tests, a driver from Texas, a man in his late sixties, came up and placed his stamp of approval on the Turnpike, saying that he had taken the "sharp" curves east of Allegheny Tunnel at 70 miles an hour. We found they were comfortable and produced no side sway at 55 miles an hour, which is sufficiently fast for any one to drive normally on the Turnpike at any point. This should be greatly reduced in passing gas stations and approaching and passing interchanges where traffic is admitted to the main highway.

On our second trip we took these same curves at 60 mph upgrade and still found no side sway. At this time "Reduced Speed Zone" signs had been installed.

Lighting

We must mention the excellent lighting of the tunnels. The double line of mercury-vapor lights in the ceiling of the tunnel, beneath the ventilating duct, are

so spaced that the circles of light on the roadway practically intersect and the driver therefore is proceeding in a fairly uniform light with no glare and is not even tempted to use his headlights, although signs at the portals instruct motorists to turn on their lights. Vision is equally good immediately in front of the car as well as at a distance, which makes the driver feel safer because he can gauge approaching traffic and can also see the distance between himself and the vehicle ahead.

A total of 1,060 250-watt Westinghouse high-intensity mercury-vapor lamps in open reflectors recessed into the tunnel ceilings is used in the 35,060 feet of tunnels. This lighting system provides three times as much light as could be obtained from incandescent sources of the same wattage. The average tunnel illumination is 5 1/2 foot-candles, approximately twice as much as in the famous Holland Tunnel under the Hudson River at New York City. The intensities in the Turnpike

(Continued on next page)

★ PREPARE

National Defense Awards with



★ Getting the correct modern equipment may become the "neck of the bottle" on National Defense jobs. Get your files up-to-date with complete information on these up-to-the-minute Barber-Greene.

TRAVEL PLANTS

The Barber-Greene Travel Plant accurately proportions, thoroughly mixes, and speedily completes the job at a rate that means the finest quality for the smallest cost. Easily converted to a Central Plant, it handles any type of bituminous or stabilizing job.

CENTRAL PLANTS

The Barber-Greene Central Plant has established new standards in portability and easy set-ups. Available for single or multiple aggregates, its accuracy and high capacity have been eye-openers to every bituminous man who has seen it in operation.



FINISHERS

The Barber-Greene Tamping-Leveling Finisher continues to lay the road by which other jobs are judged. In spite of its low cost operation, the level, uniformly compacted Barber-Greene mat is in a class by itself for excellence and permanence.



Winter 'Dozing

With Old Man Winter waiting just around the corner or, in some parts of this country, already on the doorstep, most construction jobs close down. It's a poor time to move dirt, but occasionally it has to be done and a recent issue of "The Co-operator," published by R. G. LeTourneau, offers a few suggestions to make that work easier.

For example, when starting a bulldozer in frozen ground, run one track up on a ridge, rail tie, or log laid lengthwise in the track. This will lower the opposite corner of the blade and dig in the sharp 'dozer point. With all of the tractor power turned loose on the bulldozer corner, it digs into frozen earth, hard pan and rock comparatively easily.

By moving back and forth, it is possible to wear down through the frost line and then level off the entire blade. Once through, you can clear off a strip the width of the blade and the length that you are going to shove. After this, the

blade should be kept just below the frozen ground, using one corner to widen the cut.

It will often be found necessary to raise and lower the corner of the blade to break up the frozen material. If you then back up and start shoving straight ahead, using the point of the blade, you will find it very easy to move a large load of broken frozen earth. If you are using an Angledozer, it is not necessary to use a log to lower one corner of the blade as this unit has vertical adjustments on either side arm so that one corner may be lowered for easier digging.

New 60-Hp Diesel

A new four-cylinder 60-hp automotive diesel engine, known as the Model D312, has recently been announced by Caterpillar Tractor Co., Peoria, Ill. This engine is a four-stroke valve-in-head water-cooled model with a 4¼ x 5½-inch bore and stroke. Its maximum horsepower is developed at 1,800 rpm.

Pistons in the Model D312 are of aluminum alloy; the block, cylinder head and crankcase unit are in cast alloy iron; and there are five main crankshaft bearings with a total surface of 89.5 square inches. Crank pin bearings are 2⅝ inches in diameter and 1⅞ inches in length. Water circulation is by pump, with the temperature of the water controlled by thermostat. An air-cooled-type lubricating oil cooler is provided. Pressure lubrication is provided to all main and crank pin bearings, camshaft bearings, valve operating mechanism and timing gears.

The engine fuel system is manufactured by Caterpillar and features solid injection into pre-combustion chambers. There is an individual pump and valve for each cylinder, and the system is factory-set, requiring no adjustment in the field.

For replacement installations, this Model D312 is offered as a complete unit, equipped with a five-speed Spicer No. 2553 transmission and 13-inch single-plate clutch.

Penna. Turnpike

(Continued from preceding page)

tunnels are 150 foot-candles at the portals, tapering down to 5½ at about 250 feet from the entrance.

The sodium-vapor tunnel-approach lighting extends an average of 1,800 feet out from each tunnel portal and consists of Westinghouse sodium-vapor butterfly luminaires. Sodium-vapor lamps are used because of the good visibility they provide and, even more important, because their yellow color acts as a caution signal to night drivers. The lamps are suspended 25 feet above the roadway from overhanging arms on wood and steel poles. They are spaced at increasing intervals from 125 to 350 feet apart, leaving the tunnel portals, to lessen the contrast between the bright tunnel lighting and the comparatively dim illumination provided by car headlights in the open.

Similarly sodium-vapor lamps are used at the interchanges to warn the night driver of the proximity of a section in which special caution should be exercised and to provide sufficient illumination so that all objects are visible even without automobile headlights. About 150 Westinghouse sodium units are used at the interchanges, with an average of 14, ranging from 11 at Willow Hill to 25 at Carlisle.

Reflector Units of Various Types

For the entire length of the Turnpike, at intervals of 100 feet, Cataphote Niteway Outliner reflector-button assemblies are used on the outside of the paved way about 10 feet from the concrete, and double units are used down the center strip. These act as guides to the driver and provide markers showing the motorist all the curves well in advance of the moment when the driver must turn the wheel slightly to the right or the left for the well-banked long-radius curves.

Just to the left of the joint dividing the two lanes of concrete in each direction there is a 6-inch broken line made by applying Lifeline paint and Prismo microscopic glass spheres. Almost a million linear feet of this line, including the dividing lines for the high and low-speed lanes and down the center of the tunnels to divide opposing traffic in the two lanes, was applied to the Turnpike, using three Kelly-Creswell traffic-stripping machines. On these lines in the tunnels are super-imposed mushroom indicators to serve as physical barriers to traffic which might start to wander from its proper lane.

Maintenance and Emergencies

The Pennsylvania Turnpike Commission has built five maintenance garages, to house graders, trucks, rollers, mowers and snow plows for use in maintaining the Turnpike. These garages are of cinder block construction faced with brick and measure about 75 x 55 feet in plan. They each have a flat roof with steel trusses, a concrete floor, and contain also an office, a lavatory and an addition at the back for the heating equipment. They are located at Donegal, Somerset, Kegg, Burnt Cabins and Newville. A sixth, at Everett, is the old District Office remodelled.

To combat the snow menace on the Turnpike, the Commission has installed thousands of feet of standard vertical slat snow fence at the points believed, on the basis of experience last winter, to be the most vulnerable to drifting. To remove the snow which does accumulate a fleet of Walter all-wheel-drive trucks equipped with V-plows and a group of rotary snow plows have been installed. The first snowfall since the Turnpike was opened occurred on the evening of October 20 when 2 inches of snow covered many miles of the super-highway.

(Concluded on page 42)

YOURSELF *for* complete Barber-Greene Information

DITCHERS

The milling action digging and Vertical Boom principle of the Barber-Greene Ditcher give it a great advantage whether it's cutting hard formations, or high speed cross country work. Available in three models, it gives the most economical ditching up to 8'3" deep and 24" wide.



LOADERS

There isn't any way of loading material from stockpiles to trucks as cheaply as with a Barber-Greene Bucket Loader. This together with its many other uses, screening, light excavating, etc., make it a useful tool on every job.



CONVEYORS

Barber-Greene Belt Conveyors are built for contracting, for frequent set-ups, knock-downs, and rearrangements. Their Standardized Sectional Construction is available to the contractor. Portable or permanent in any desired length.

Mail today

Just clip this coupon to your letterhead and check the items on which you would like complete information. There is a booklet on each subject. No obligation.

- | | |
|------------------------------------|------------------------------------|
| <input type="checkbox"/> MIXERS | <input type="checkbox"/> LOADERS |
| <input type="checkbox"/> FINISHERS | <input type="checkbox"/> CONVEYORS |
| | PORTABLE |
| <input type="checkbox"/> DITCHERS | <input type="checkbox"/> CONVEYORS |
| | PERMANENT |

40-15

Barber-Greene Company, Aurora, Illinois

BARBER-GREENE





The Westinghouse Type A-8 floodlight

Aluminum Reflectors On New Floodlights

For use in lighting night work on construction jobs, two new light-weight weatherproof floodlights, known as A-8 and A-10, have been added to the line of floodlights made by the Westinghouse Electric & Mfg. Co., Lighting Division, Edgewater Park, Cleveland, Ohio. These lights have been made available at lower prices through the use of etched aluminum reflecting surfaces.

A one-piece reflector is employed to which is attached an extruded aluminum socket housing, thus providing sturdy rigid construction. The lens is held in place by a metal retainer ring. This assembly is mounted on a cast aluminum mounting bracket allowing horizontal adjustment through 360 degrees and vertical adjustment through 135 degrees. Either a flat base or a ground spike base is available.

The new A-8 fixture is 8 inches in diameter and employs a 100-watt lamp; the A-10 is 10 inches in diameter and uses a 200-watt lamp. Both are available with either plain or spread beam light distribution, and with plain or colored lenses. Standard colors are red, green, amber, and blue.

Use of Snow Fence To Prevent Drifts

Pointing out that an ounce of prevention is worth a ton of shoveling, a new folder on Big Red snow fence, recently issued by the Illinois Wire & Mfg. Co., Joliet, Ill., describes and illustrates the vertical slat fence made by that company.

This Big Red snow fence is made on special machines which force the pickets tightly between the wires so that they will not come loose even under very severe conditions, according to the manufacturer. The fence is stretched after weaving and before being placed in rolls. The wire used in this fence is specially galvanized by a new process providing a heavy ductile coating which will not crack or peel. The pickets, 7/16 x 2 inch and spaced 2 1/2 inches apart, are of sound live timber treated with red mineral preservative which prevents decay by killing fungus and sealing the pores. The fence is available in 4, 5 and 6-foot heights.

Recommendations for erection of Big Red snow fence are also included in this new folder, copies of which may be

secured by interested state, county and town highway engineers direct from the manufacturer by referring to this item.

Fluid Drives Serve Construction Field

Fluid drives, the year's big news in the automotive industry, are also making news in other fields, including that of construction, according to a recent announcement of the American Blower Corp., Hydraulic Coupling Div., 6000 Russell St., Detroit, Mich.

A Euclid truck with an American Blower traction-type hydraulic coupling fluid drive is now in service in Minnesota and in the same area, a P & H 2 1/2-yard shovel with fluid drive is operating successfully. A big dredge working in the Tennessee River has just had its cutter head equipped with a Size 15 traction-type fluid drive. The first day's run of 418 tons was reported to be more than 7 per cent better than the best previous day's run without the fluid drive.



UNION HAMMERS

The snapshot shows a Type A UNION HAMMER with patented sleeve type base for driving archweb steel piling. Note how the base can be turned, to set over piling. For further important information on UNION HAMMERS see our Bulletin No. 184, just off the press, covering hammers and handling equipment.

UNION
IRON WORKS, INC.
P. O. BOX 18 ELIZABETH, N. J.



But don't forget that much of the improved performance of today's trucks comes from improved gasoline.

Engines and fuels progress together. As fast as better fuels are made available by oil companies, engine designers build better engines to make use of them. In past years, the anti-knock rating of regular gasoline has climbed continuously. This in turn has allowed engine designers to increase commercial vehicle compression ratios with

resultant increases in efficiency.

Now in 1940 there has been a sudden acceleration of the trend to higher anti-knock levels. The practical value of this improvement in gasoline properly applied will be reflected in faster schedules, greater mileage, and bigger payloads.

Just as the Ethyl research laboratories cooperate with refiners to produce better gasoline, so they cooperate with truck manufacturers and operators to help them make the most of this better gasoline. Extensive road tests and the practical experience of fleet engineers have shown that there are three ways in which you can take advantage of today's improved fuels:

1. In older vehicles by installing high compression pistons or cylinder heads (as



Information to enable operators to improve the performance and economy of their vehicles is secured by both laboratory and road tests on heavy duty engines at the Ethyl research laboratories in Detroit, Mich., and San Bernardino, Calif. If you have any questions about truck fuels and engines, our fleet engineers may be able to supply you with the necessary information.

supplied by the manufacturer) when engines are overhauled or rebuilt.

2. In present vehicles which have high compression engines, by advancing the spark as far toward maximum efficiency as the improved gasolines will permit.

3. In purchasing new equipment by investigating the compression ratios available and specifying a ratio high enough to take full advantage of modern gasoline.

Ethyl Gasoline Corporation, manufacturer of anti-knock fluids used by oil companies to improve gasoline.



Fleet maintenance men and representatives of the petroleum and automotive industries get together in these fleet conferences, sponsored by Ethyl, to discuss mutual problems. This supplements the service of Ethyl fleet engineers in aiding operators to take the best advantage of their engines and fuels.

Aercoil OIL BURNING CONTRACTORS' EQUIPMENT

- KETTLES FOR TAR, PITCH & ASPHALT • EMULSION DISTRIBUTORS
- POWER SPRAYS • LEAD MELTING FURNACES • WEED BURNERS
- TORCHES & BURNERS

Send for FREE Bulletin No. 100-C
Aercoil Burner Co., Inc.
West New York, New Jersey
Chicago • San Francisco • Dallas

MAKE BETTER USE OF TODAY'S BETTER GASOLINE!

Grading a New Road With Scraper Outfit

W. W. Magee Completes New Location for Road Between Rockford and Buffalo, Minn.; M. R. Mogren Does Sodding

(Photos on page 44)

THE work of W. W. Magee between Buffalo and Rockford, Minn., seemed a bit useless when visited, as the grading ended in a field at the Buffalo end and was almost dead-ended at Rockford, but that condition was only temporary, awaiting the award of contracts to extend the fine new location at both ends to connect with existing roads. Magee's job involved the preparation of a 36-foot grade, common excavation of nearly 325,000 cubic yards, overhaul of 837,480 station-yards, and a large volume of peat excavation requiring over 600 hours of dragline operation.

Handling One Large Balance

One single balance of about 21,000 yards near the Rockford end of the job shows the manner in which the work was handled, except for some unusual operations. With this and other work the average haul for the Carryall scraper outfits was about 800 feet and the maximum about 1,100 feet. Magee used three 12-yard Carryalls with RD8's and one 9-yard Carryall pulled by an RD7. In this case there was one large knob that was hauled both ways to balance points, instead of two knobs being hauled to the balance in the center as usually occurs on large grading jobs.

The material, a good earth with some clay, was spread in 12-inch layers and rolled with a Bros sheepfoot roller pulled by a John Deere tractor. The material packed so well under the heavy loads and the large tires of the Carryalls that most of the time the sheepfoot roller rode on the surface with little packing effect. Hard places in the excavation, where it would have been necessary to use a pusher with the Carryalls, were broken up with a Killefer scarifier pulled by an RD7. A Caterpillar No. 66 grader with motor control was used to finish the grade.

General Design and Operation

This grading job was handled entirely with Carryall scrapers. When the work was begun at the west end there was too much rain so the contractor finished only one mile and then moved to the middle and worked toward Rockford. As the east end was reached there was a lack of sufficient dirt to finish the

fill, requiring a slight change in the slopes and grade to get the material. Boulders running as large as 2 and 3 cubic yards were encountered at the Buffalo end but they were met early enough in the work so that they could be snaked out and buried in the higher fills with a minimum of 2 feet of cover beneath the finished grade.

The design grade is 36 feet wide with uniform shoulder slopes of 4 to 1, and slopes running from 3 to 1 on the higher fills to 4 to 1 elsewhere. In the cuts the back slopes ran from 2 to 1, for the steepest, to 10 to 1. The maximum fill on the job was 19 feet high, running 13,000 cubic yards on a curve. The ditches were rounded 3 feet below shoulder grade and all tops of cuts were rounded on a 6-foot radius. There was no hand



C. & E. M. Photo

Knocking off the big knob near the Rockford end of the job with a Model F Carryall and RD7 tractor, on the W. W. Magee 6.2-mile grading job in Minnesota.

finishing of slopes or grade, all this work being done with the bulldozer or a drag. The drag was pulled by a pair of horses hired from a local farmer. It was necessary to do a small amount of hand finishing on driveways at farm entrances.

A novel sight in the finishing of some of the higher slopes was an RD7 moving slowly across the face of the slope pulling a sheet metal stone boat, and apparently no operator for the tractor. He was leisurely following the outfit

(Concluded on page 27)

KOEHRING and PMCO

*-Team up
to make this
KOEHRING NO. 801
a big producer!*

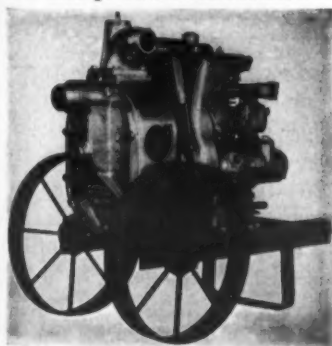
**2-YARD
WELDED
DIPPER**

● A 2-yard PMCO quarry dipper. Note the extra wide opening with points set out at the corners—this gives easy entrance for the dipper. It enables the operator to clean up and handle rock with greater ease.

MANY users of Koehring shovels equipped with PMCO welded dippers are enthusiastic in their praise of the smooth, high production obtained. More shovel manufacturers and users are daily adopting the PMCO welded dipper because of its superior design and structural advantages, which result in added capacity.

Pettibone Mulliken engineers are ready to give personal service on your dipper requirements. Attention is given to specially designed dippers for particularly difficult digging conditions.

Are You Tired of Pump Headaches?



Marlow Pumps give continuous and genuine satisfaction. Sizes 1½" to 10" self-priming centrifugal. Also diaphragm and plunger pumps.

Ask for Bulletin CEM-42

MARLOW PUMPS

Ridgewood New Jersey

PETTIBONE MULLIKEN

**Offers You
Personal Service
Prompt Deliveries
Economical Production**

SEND FOR BULLETIN 0100 and get the facts about this sensational new development in welded dipper construction.



We operate the largest, most modern Manganese Steel Foundry in the United States

PETTIBONE MULLIKEN CORPORATION

Established 1880

4710 West Division Street, Chicago, Illinois

Road-Mix Surface For Mass. Town Road

(Continued from page 2)

this specification with an Engler viscosity of 26-40 at 50 degrees C. was used.

For the decrowning operation, or wedge course, and for widening, the windrow and binder were mixed by a Galion hydraulic power grader working the full width of the windrow across the road and back about three times so that the material was thoroughly mixed and cured. Spreading followed immediately after this, but even better results are secured when the mix is kept open to the air for several days of dry weather for further curing through the evaporation of the solvent. A longer period of curing is required if the weather is humid or cold. This material cannot be rolled satisfactorily until it is fully cured, as it will creep under the rolls.

On the Wareham job, while the spreading was being done following the curing, the dual pneumatic-tired trucks were run over the wedge courses on either side of the road to give the initial compaction. This method leaves the surface in very good condition for the final grade ahead of power rolling. During the initial compaction, all stones larger than 1-inch were hand picked and thrown out. Traffic was never held up during the work on this road, except on the section where the windrow was spread and the binder had been applied. As soon as this was mixed, traffic was permitted to go over any part of the road to get by the grader.

Surface Course

The surface course consists of 3 inches of Cape Cod gravel road mix with the same Tarvia binder as the wedge course, and with exactly the same procedure. After the surface was completed, traffic was allowed to use it for three weeks to give it the kneading which can only be secured with rubber-tired vehicles. Following this, the surface was swept clean by hand and by a rotary broom, and then 1/3 gallon per square yard of 26-40 viscosity Tarvia retread was applied and covered with 40 pounds per square yard of screened sand. This was hand cast with care to fan it out along the road and not in ridges across the road.

This work was done by the Highway Department of the Town of Wareham, Mass., under the direction of John B. English, Superintendent of Streets.

Wire Rope Connectors

Positive-Grip Electroline-Fiege wire rope connectors are available in a type and size for every kind of wire rope or strand used on cranes, shovels, draglines, derricks, dredges, pile drivers,

hoists, drill rigs, slings, guy lines, and aerial tramways. These connectors are compact, strong, and simple to install, and are so constructed that the wires of the rope are locked in a socket, back of a tapered plug which enforces a progressive positive grip when strain is applied.

Copies of Bulletin F-2, illustrating the various types and uses of these wire rope connectors, may be secured by interested contractors and engineers direct from the Electroline Co., 4092 So. La Salle St., Chicago, Ill., by mentioning this item.

New Small Trailer For Tractor Units

The Martin Model TRD4 trailer, made by the Martin Machine Co., Kewanee, Ill., is designed for hauling Trackson high shovels and other equipment mounted on D4 Caterpillar tractors. The problem of clearance is solved by placing the load-carrying plates close to the

ground, permitting a high load without interference with overhead obstructions, and at the same time leaving ample road clearance.

Loading of the Martin trailer is accomplished without planks, blocks or ramps, by removing the trunnion pin, lowering the front of the trailer to the ground, and driving the tractor on to the trailer. The front of the trailer is raised by the Martin hydraulic trailer lift, a piece of optional equipment, and the trailer is then attached to the rear of the towing truck or to the front axle assembly. Unloading is a matter of reversing this procedure.

The frame of this trailer is made of heavy structural steel, electrically welded throughout, with its 10-inch main frame members spaced 42 inches apart. The 14-inch tread plates are securely welded 7 inches from the top of the main frame members and support the tractor the full length of its tracks. Rigid cross bracing prevents distortion of load-bearing plates. Timken tapered roller bearings, protected by grease seals, are

used on all axles. The Budd wheels have 20 x 6-inch and 20 x 7-inch rims for various-size tire equipment. The trailer is equipped with two single front wheels and dual rear wheels, or a two-wheel model is available in which the front is supported by the rear of the towing truck.

A bulletin giving further details on these Martin trailers may be secured direct from the manufacturer by mentioning this magazine.

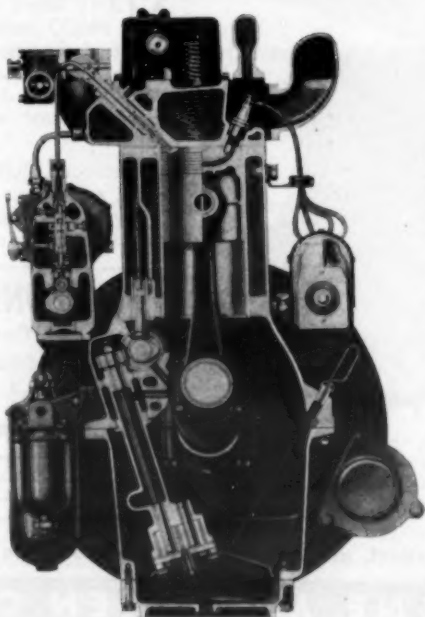
Diamond T Plant Addition

Plans have recently been completed for a new \$175,000 addition to the Diamond T Motor Car Co. plant in Chicago. The building, 600 x 120 feet, will be used principally in connection with the \$3,500,000 government order for six-wheel-drive extra-heavy-duty trucks recently awarded to Diamond T. It is of poured concrete construction with steel sash windows in front and on the sides. The G. W. Snyder Co. has the contract for its construction.

24 HOURS A DAY
where the Going was Tough



WAUKESHA ENGINES



On the famous Pennsylvania Turnpike . . . where the going was plenty tough and contractors were working against time . . . Waukesha-powered Ingersoll-Rand Portable Compressors were on the job 24 hours every working day.

There's a record of dependable power and performance for you—the result of a unified power plant. In every I-R Portable the engine and compressor are built into a single unit. That means reliability and economical, trouble-free operation.

Not only have Waukesha Heavy-Duty Engines powered I-R Portables for the past 27 years, but they are giving equally impressive service on thousands of shovels, cranes, hoists, pavers, mixers, graders, surfacers, tractors, and other industrial machines.

It will pay you to standardize on Waukesha Engines. Sizes from 10 hp. to 350 hp. for gasoline or oil operation. Write for Bulletin 1079.

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN
NEW YORK • TULSA • LOS ANGELES

**WON'T QUIT
or cause time out**



A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

The Hayward Company

52-36 Day Street
New York, N.Y.

Hayward Buckets

WAUKESHA ENGINES Power
ALL I-R Portable Compressors

SHOVELS • DRAGLINES • CLAMSHELLS • PULL-SHOVELS
CRANES • WALKERS • from 3/4 cu. yd. to 35 cu. yds. • Gasoline • Diesel • Electric

A TOUR OF THE

Pennsylvania Turnpike

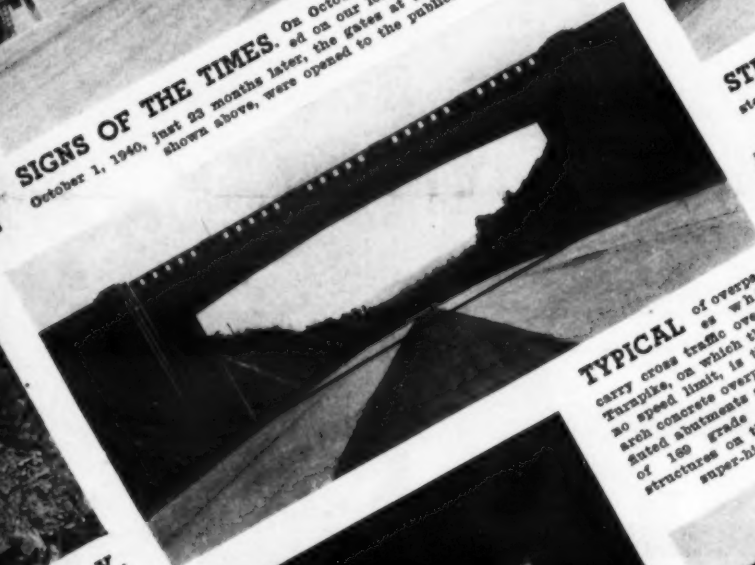
NEW 160-MILE TOLL ROAD
FROM PITTSBURGH
TO HARRISBURG



SIGNS OF THE TIMES. On October 23, 1938, work was started on our longest super-highway. On October 1, 1940, just 23 months later, the gates at the western terminus, shown above, were opened to the public.



STEEL and concrete, watchwords of this era, make such a project as the Pennsylvania Turnpike possible. The steel girder bridge above is located about 12 miles from the western end of the highway.

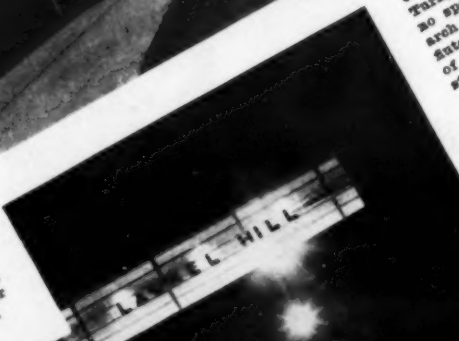


TYPICAL of overpasses which carry cross traffic over the Turnpike, on which there is no speed limit, is the flat-arch concrete overpass with slotted abutments above, one of 160 grade separation structures on this 160-mile super-highway.



DRAINAGE. This catch basin is part of the carefully planned system of surface drainage and installed throughout the length of the Turnpike.

SAFETY. To make sight driving safe, single lining safe reflectors, as shown above, are used to mark the sides of the Turnpike, and double reflector units are installed in the center strip for the entire length.



GUARD RAIL. In keeping with the new era highway standards, slopes on the Turnpike were built to a 4 to 1 ratio. Where the guard rail was possible, it was installed for safety.



SCENIC is the word for this new route. Here it passes through Fannettsburg, with a township road above and railroad below.



NIGHT AND DAY. The portal to Laurel Hill Tunnel as it is now and as it was under construction on October 6, 1938.

LIGHTING the traveler on his way through a mountain. Mercury vapor lamps, used for the first time for tunnel lighting, are mounted flush with the roof of the tunnel.

WEST PORTAL of the 6,070-foot tunnel. Note Allegheny Mountain. Note South Penn RR tunnel at right.

THEN AND NOW. This side on the Herman Holmes 14,520-foot grading contract west of Bedford has been transformed into the scene below.

BIG ROCK CUT. Just beyond the overpass is Clear Ridge cut. W. E. Corbello, Inc., had the contract for this 1,150,000-yard earth and rock cut and, above, some of his equipment is seen in the early stages of the job.

VIADUCT. A feature of the work on the New Stanton viaduct was the elaborate falsework for the arch. Top, the completed structure.

WARNING signs are all large enough to be seen at high speeds and have reflector buttons for easy night visibility.

INTERCHANGE. Sodium-vapor lights indicate reduced-speed zones at the ten interchanges and all tunnel approaches on the Turnpike. The "caution" yellow of these lights has proved very effective.

CROSS ROADS at interchanges are well marked by over-size Federal and State route numbers.

APPROACH over a curve to the right to the east portal of Allegheny Tunnel. All curves on the Turnpike have long sight distances and are super-elevated for safety.

Highway Design and Highway Accidents

(Continued from page 4)

porting pedestrian, same-direction, fixed-object, off-roadway, head-on, turns and right-angle accidents shows an increase of thirteen accidents during the day and an actual reduction of one accident at night. Even though there was an increase of 20 per cent in all accidents after the roadway improvement, there was a 50 per cent decrease in fatal accidents. Accidents classed as "head on" and "same direction" were substantially reduced while marginal accidents and those at intersections showed a very real increase.

To make this report of real value to highway designers and builders who desire to make new highways safer from every possible standpoint, a careful study must be made to show a logical explanation for the increases in accidents which were certainly not expected when the improvements were

made, and to eliminate any other features of construction, or the lack of them, that were the newly created causes of accidents. The report states:

"It is found, for example, that most of the 'off-roadway' collisions which it would seem offhand would be decreased by the improved shoulders resulted frequently from a car being forced completely off the shoulder by other vehicles attempting to convert what had been a definite 2-lane road into a 3-lane road. The large increase in 'fixed-object' collisions was unquestionably due to the fact that the improved shoulders provided a roadway width in excess of that available on many old bridges. The bottlenecks thereby created at the bridges resulted in fixed-object collisions with the railings. The turning accidents increased because of the widened area for maneuvering at intersections, and the temptation to turn at points where it would not have been attempted with the original pavement."

Great credit is due the Committee for calling to the attention of all highway

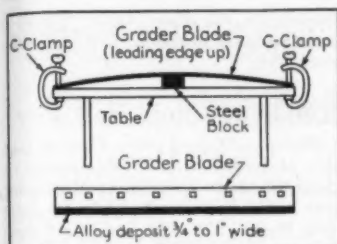
designers, in Bulletin No. 66* of the A.R.B.A., the fundamental weaknesses of highway design that have created accident hazards so that they may overcome the deficiencies of our present roads and help in reducing the mounting toll of life and property.

*Copies of this report may be secured from the American Road Builders' Association, International Bldg., Washington, D. C., by mentioning this magazine.

Maginot Line-Turnpike

Some statistician with time on his hands has worked out some interesting and illuminating comparisons of two great construction projects of recent years: the Maginot Line, that lengthy underground fortress which was to have kept the Nazis out of France; and the Pennsylvania Turnpike, this country's longest and greatest super-highway.

	Maginot Line	Turnpike
Men employed	15,000	15,000
Excavation	20,000,000 cu. yds.	28,000,000 cu. yds.
Steel	60,000 tons	44,500 tons
Concrete	2,500,000 cu. yds.	1,650,000 cu. yds.
Length of time for completion	10 years	1.92 years



Set-up for hard-facing grader blades.

Method of Renewing Road Grader Blades

A practical hint for the procedure of hard-surfacing road grader blades in order to offset warpage is given in the October issue of *Oxy-Acetylene Tips*. It is suggested that a normalized or annealed 0.15 to 0.25 carbon steel blade be used and that, during hard-facing, the blade be supported on a table with the leading face up, the blade being bent convexly as indicated in the accompanying sketch.

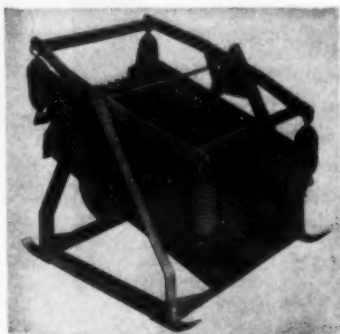
The steel block under the center of the blade should be $\frac{1}{2}$ inch thick for an 8-foot blade of approximately 0.20 per cent carbon steel. Thicker blocks are used for higher carbons. Hard-facing is done with the blade clamped in this position. Either Haynes Stellite No. 1 rod or Haystellite tube rod of 100 on 200 mesh tungsten carbide particles is applied by a blowpipe corresponding in size to an Oxweld W-17 blowpipe with a No. 40 head (old style No. 10). The deposit is made $\frac{1}{16}$ to $\frac{3}{32}$ inch thick, $\frac{3}{4}$ to 1 inch wide, and extends the length of the blade on the lower edge of the leading face.

When hard-facing is completed, the clamps are released. The blade will then be found to be so nearly straight that the bolts for holding it to the mold-board of the grader will pull it up easily.

Westinghouse Promotions

Announcement has been made by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Penna., of the appointment of C. B. Ketcham as Manager of the Cincinnati, Ohio, office and of C. G. Jewett as Manager of the Columbus office.

Mr. Ketcham, who succeeds the late F. R. Colville, takes over his new duties after 10 years as Manager of the Westinghouse office in Columbus.



THIS PORTABLE VIBRATING SCREEN

accurately separates 3 sizes of 100 tons of material per day. Uses only the power of 2-hp. gas engine or 1-hp. electric motor. Self-contained, easily moved. Ideal for road and construction work, concrete block making and in small quarries and factories. Available through your local equipment distributor.

Send for
"CONTRACTOR'S
SCREEN"
Bulletin 110

ROBINS

ROBINS CONVEYING BELT COMPANY
Passaic, New Jersey
Offices in principal cities.

LIMA

type 1201

Shovel or Dragline

You will like the LIMA Type 1201 combination shovel and dragline for its big output in heavy duty digging; its wide working ranges; its accurate, speedy operation and low up-keep cost. The standard shovel is equipped with a 30' boom, 20' dipper handle and a 3 yard dipper, however, where work requires a high lift machine, a 42' boom, 32' dipper handle and a 2 1/2 yard dipper can be furnished. For dragline operation, booms may be had up to 100'. Take a tip from the many owners of LIMA Shovels, Draglines and Cranes, who are getting maximum results from their investment and make your next machine a LIMA.

LIMA LOCOMOTIVE WORKS, Inc.
Shovel and Crane Division LIMA, OHIO, U. S. A.

Dallas, Texas
Newark, New Jersey
San Francisco, Calif.

Memphis, Tennessee
Seattle, Washington
Los Angeles, Calif.

LIMA S ARE BUILT IN 3/4 YARD CAPACITY and LARGER

Quick-Change Snow Plows For Light-Duty Trucks

According to the Root Spring Scraper Co., Kalamazoo, Mich., its experience with the unusual heavy snows of 1936 prompted the building into new Root snow plows the following features: A moldboard with more lift and curvature for greater efficiency in discharging and throwing snow at all speeds; an improved mounting and hitch to make the initial installation of the plow easy and quick, without any alteration whatsoever to the truck; a new level lift which

raises the entire plow blade a full 12 inches from the ground, keeping the edge horizontal at all times; and interchangeability of the blade and V moldboard on the same frame assembly.

A catalog describing these features in detail may be obtained direct from the manufacturer by mentioning this item.

Arc Welding Lessons

A series of lessons in arc welding, which serve the basis of instruction in the Lincoln Arc Welding School, has been published in book form in order

to present in a concise manner certain fundamental facts of welding, the knowledge of which will enable an operator to use the welding process successfully and economically.

The details of the various welding operations, illustrated with charts and diagrams, are given, with many "do's and don't's," and in the back is a set of questions on each lesson, to provide a check on the progress made by the student.

Copies of this 136-page book "Lessons in Arc Welding" may be secured by those interested direct from the Lincoln

Electric Co., Cleveland, Ohio. Price: 50 cents postpaid in the U. S. A.; 75 cents elsewhere.

Mills of Chain Belt Dies

Morrison Mills, Eastern District Manager of the Construction Equipment Division of Chain Belt Co. of Milwaukee, died suddenly at his home in Philadelphia, Penna. Mr. Mills had been Service Manager of the Construction Equipment Division of the company from 1931 to 1937, and Eastern District Manager since 1937.

\$1,300,000

worth of **CONFIDENCE**

Contractors building the Pennsylvania Turnpike placed confidence in Koehring Heavy-Duty Construction Equipment to the extent of more than \$1,300,000. Koehring equipment was used at the very beginning of excavating and grading operations, through the pouring of the slab and finishing of the slab surface.

Confidence, that Koehring Heavy-Duty Construction equipment would, under the high speed Turnpike schedule, carry the load of the extra-service hours without serious interruption of production schedules, is the reason why so many contractors felt secure with Koehring equipment.

To have received this recognition of quality, to have been a part of this modern construction masterpiece, the Pennsylvania Turnpike, is an honor we humbly accept as a vindication of our policy of building quality and service into Koehring equipment.

Many more millions of dollars worth of Koehring equipment is being used daily throughout the country, helping contractors make profits. If you are not a user of Koehring equipment, be sure to obtain complete information about it, before you purchase your next unit — for excavating, hauling, mixing concrete for highways or structures, and other related operations.

KOEHRING COMPANY
MILWAUKEE, WISCONSIN



picki
the
Be
the l
work
Min
takes
requi
in thi
of dra
cated
of-way
This r
along
states,
excava
the co
air dra
1¼-ya
In c
sub-ba
specifi
be exca
backfill

There
gated in
contract
small s
neath th
with sp
only ga
access r
tractor t
side the
cutting.
Concre
the large
as well a
concrete
the fill.
the head
Jaeger 2-
through m
mixer for
ons serve
it elimin
oil drums
verts. All
wheelbarr
scales.

All slop
with black
wherever t
ral ground
steep and
were sodd
grades wer
done by s
of Maple
about 2 r
carefully
and haule
ground al
disked wi
tractor pu
12-inch d
while two
piles along
did the d
of the dit

Do you wis
handlin
SE
DE
DU
F
N
A
DEMPSTER

Grading and Sloping On Minnesota Route

(Continued from page 19)

picking up roots and rocks and tossing them onto the stone boat.

Peat Excavation

Because of the uncertain character of the length of time and the nature of the work involved in peat excavation, the Minnesota Department of Highways takes bids on an hourly rental of the required excavating equipment, which in this case was estimated as 637 hours of dragline operation. The peat was located right in the middle of the right-of-way and from 8 to 15 feet in depth. This material was all wasted as spoil along the fills and not used, as in most states, for dressing slopes. The peat was excavated, using the estimated time of the contract, with a Bucyrus-Erie gas-air dragline with a 50-foot boom and a 1 1/4-yard P & H dragline bucket.

In cases where the material of the sub-base in cuts is unsatisfactory the specifications require that the material be excavated 2 feet below grade and be backfilled with satisfactory material.

Drainage Structures

There was a large footage of corrugated iron culverts for drainage on this contract and all farm access roads had small sizes of corrugated culverts beneath the road. These were finished off with special sloping ends which not only gave a neater appearance to the access road but also enabled the contractor to carry the slopes down alongside the culvert pipe and prevent undercutting.

Concrete pipe culvert was used for the larger sizes and one 48-inch culvert as well as some of the smaller ones had concrete headwalls for the protection of the fill. For handling the concrete for the headwalls, the contractor used a Jaeger 2-bag mixer with a 6-foot stock trough mounted on the frame over the mixer for the water supply. Tank wagons served this trough as required but it eliminated the stocking of water in oil drums along the shoulder at all culverts. All aggregate was weighed in wheelbarrows on Johnson wheelbarrow scales.

Sodding Slopes

All slopes of all cuts were covered with black soil to a depth of 6 inches wherever the cut was 3 feet below natural ground. Then when the grades were steep and the slopes might wash, they were sodded. All ditches on similar grades were also sodded. This work was done by subcontract by M. R. Mogren of Maple Plain, Minn. The sod was cut about 2 miles from the road, rolled carefully to preserve the root system, and hauled in on flatbed trucks. The ground ahead of laying the sod was disked with a Standard Twin garden tractor pulling a double gang of four 12-inch disks. One man laid the sod while two others carried it in from the piles along the road. Two other men did the disk and raking the grade of the ditch or slope to remove stones



C. & E. M. Photo
Remote control—the operator clears the slope while the tractor runs in low across the face of the cut.

or other debris and to smooth the ground.

The sod was hand rolled and then wet down regularly after laying to give the grass a start in its new location. Water was secured from a small stream which was dammed, and was pumped into an old gasoline tank wagon by a Rex 3-inch centrifugal. The water was run out of the tank wagon by gravity through two hose for wetting ditches but the use of the pump on the wagon

was required for wetting the slopes.

Major Estimated Quantities

Some of the major estimated quantities in this contract were:

Clearing	8.9 acres
Clearing	51 trees
Grubbing	12.5 acres
Grubbing	248 trees
Unclassified excavation	324,562 cubic yards
Overhaul	837,480 station-yards
Dragline rental for peat excavation	637 hours
Area sodding	48,868 square feet
Gravel surface*	5,480 cubic yards

*488 cubic yards of this was for entrances and approaches to farms, the balance for stabilizing the surface of the grade as completed.

Personnel

This contract, FAP-563-A-1, for 6.2 miles of grading was awarded to W. W. Magee of St. Paul, Minn., on his low bid of \$78,400. J. H. Brady was Superintendent for the contractor and G. F. Barstow was Project Engineer for the Minnesota Department of Highways on this contract.

New Sullivan Dealers

Announcement has been made by the Sullivan Machinery Co., Michigan City, Ind., of the appointment of two new distributors. The E. T. Credle Equipment Co., 1313 Seymour Ave., Utica, N. Y., will handle Sullivan air compressors, rock drills, drill steel sharpeners and furnaces, concrete breakers, portable hoists, and accessories in Madison, Oneida, Herkimer and Lewis Counties in New York State; and the Carolina Tractor & Equipment Co., Salisbury and Raleigh, N. C., will handle the Sullivan line of equipment in the state of North Carolina.



IT'S THE BIG ONES

THAT TEST A DUMP BODY'S STRENGTH

Hercules "Service Built" Bodies and Hoists combine brute strength with perfectly controlled dumping action. Heavy-gauge, reinforced steel bodies are available in every style and capacity for the toughest hauling jobs.

Bridge-type construction of Heavy-Duty Hoists assures easy handling of capacity loads. Both light and heavy duty hoists are of the Center-Lift type—lifting the load on a ten-foot body ahead of body center. Hoist action is fast and smooth. Available in 6, 7, 8 and 10-inch cylinders. Capacities up to 20 tons. Immediate service assured through nation-wide distributing organization.

CENTER-LIFT
IS EASY LIFT

HERCULES
Center
DUMP
LIFT Hoist
BODIES

HERCULES STEEL PRODUCTS CO. GALION, OHIO

Do you wish a really superior dumping unit for handling 2-cu. yd. Detachable Buckets?
SEE OUR MODEL LF
(Load Forward)

DUMPSTER

For any 1 1/2-ton truck
NO
COUNTERWEIGHT
OVERHANG
SIDESWAY

All the load on the chassis.
DUMPSTER BROS. INC. Knoxville, Tenn.

Avoid Legal Pitfalls

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Edited by A. L. H. STREET, Attorney-at-Law.

Contractor's Liability for Car Skids

That a highway contractor is acting on behalf of a state, county or some other public agency does not make him immune from liability to travelers for accidents that can be laid to his fault. Many are the cases in which a contractor has been held liable for failing to maintain proper warnings and barricades to prevent automobiles being driven into excavations and obstructions. But these cases do not exhaust instances in which a highway contractor, or his insurance company, may get on the losing side of a lawsuit. Creating and leaving slippery conditions on a road open to travel is one way of putting a job in the "red."

In a New Hampshire case, a contractor constructed and maintained a temporary bridge over a river. One approach was constructed of dirt, with sharp "S" curves. An automobile driven along the approach skidded through a railing of the bridge and fell into the river, causing the driver's death. The Supreme Court of the State decided that it was open to a jury to find that the contractor was negligent in failing to sand the approach, which had become slippery through a fall of snow and hail. The court also said that the fact that a similar accident had occurred at the same place, as well as the nature of the surroundings, should have apprised the contractor of the dangerous condition of the approach. And it was further decided that the circumstances of the case were such that a jury might conclude that the contractor was negligent in failing to maintain a watchman at the point to warn travelers. (164 Atl. 767.)

Mud on Pavement

There are several appellate court decisions to witness the point that it is a risky matter to permit trucks bearing dirt to be so overloaded as to cause dirt to fall upon a hard surfaced highway, where rain will turn it into slippery mud. One of these decisions was rendered by the Nebraska Supreme Court in a personal injury case where a car skidded in attempting to stop back of a street car. The skid was traced to a spill of clay from trucks, plus rain that made the clay-smeared street slippery. The Court decided that if the negligent spilling of the dirt on the street surface was a direct cause of the car skidding and striking the plaintiff, a pedestrian, the contractor was liable, although negligence of the driver of the automobile may have been a factor in the accident. (254 N. W. 695.)

In another case, decided by the Florida Supreme Court, the roadway of a bridge was rendered slippery and dangerous through material that dropped from trucks operated by a highway contractor. Result: a motorist was injured and the contractor was stuck for damages. The contractor's attorneys may have grown husky in voice in arguing to the court that he assumed no obligation under his contract to keep the bridge in safe condition. But the court ruled that, regardless of the terms of his contract, the contractor was bound to refrain from any careless acts that would have a natural tendency to imperil travelers. (Price v. Parks, 173 So. 903.)

Slippery Pavements

In Massachusetts, an automobile skidded on a slippery bituminous pavement which had just been laid. The car overturned and the occupants were injured. The Supreme Judicial Court of the Commonwealth said that the paving contractor was liable. (115 N. E. 291.) The court said that even if the contractor, acting under directions of the state highway department, would not be liable for merely laying a bituminous surface that was thicker than it should have been, a jury could find that the contractor was guilty of actionable neglect in failing to suitably warn travelers. The court remarked:

"The thick and slippery layer of . . . (bituminous material) . . . covered the entire width of the road, and came to an end at the top of a hill where it could not be seen from approaching vehicles. The road was left open for travel, with a stretch of half a mile unsanded and unguarded. It could be found that the duty of warning the traveling public of this dangerous condition rested upon and was assumed by the defendant. The warning signs belonged to the defendant corporation; and its employees on the truck attended to the placing of them. . . . The only sign at the end of the work was one 14 inches square, and about 2 feet from the ground; and it was placed in the grass 2 feet outside the road at a point 3,000 feet from the place of the accident. It was not seen by the plaintiffs, and the jury could find that it was unsuitable or improperly located, for the purpose of warning travelers."

The court strongly intimates that half of the highway ought to have been left in proper condition for travel while the other half was being treated.

Judges Couldn't Agree

In New Jersey a youth sued for damages for injuries sustained when the bicycle ridden by him skidded on a freshly oiled road. A majority of the judges of the Court of Errors and Appeals of the State decided that the contractor was not liable even if it violated its contract with the county. The contract required the contractor to protect the road from traffic for six hours after spreading the oil, or until it had permeated the surface, and required the oil to be spread on one side of the road at a time. A majority of the judges decided that the contract was a matter wholly between the county and the contractor, that it gave travelers no rights, and that if the county and the contractor saw fit to modify the contract by permitting the road to be oiled the full width at one time, no traveler could complain. (Lydecker v. Board of Chosen Freeholders, 103 Atl. 251.) The court recognized that the mere fact that a contractor does work for a county will not exempt the contractor from liability for creating a nuisance. "But," added the court, "this is not applicable where the work . . . is not obviously likely to create a nuisance. . . . In the present case the contract calls for the spreading of a given quantity of oil per square yard, for a lawful purpose, by the use of a particular machine (that is, one approved by the county), and the nuisance resulted only because the county erred in its specification of what was required. We think that in such case the negligence, if any, was that of the county, and it alone is liable; otherwise, every contractor will be an insurer of the sufficiency of all specifications for public work. . . ."

"We are of opinion that a contractor with

a municipality for public work is not liable under his contract to a third party for injuries resulting from a mistaken estimate by the municipality as to the effect of the performance of the contract according to the means and method it requires, or for the sufficiency of its provisions to fulfill a duty which the municipality owes to the public, unless the work and required method of performance is obviously or inherently dangerous, of which the contractor had notice, or was chargeable therewith. The spreading of oil on a public highway of the quantity and by the means provided for by this contract cannot be said to be inherently dangerous, or obviously liable to create a nuisance."

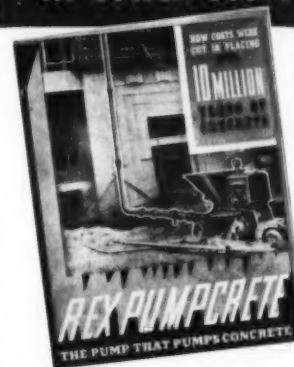
A minority of the court—five judges—took the view that the way the oil was spread in this instance did create a nuisance, and that the contractor could not shield himself by pleading that what he did was done in compliance with a contract with the county.

From what has been said above, it is not to be supposed that a contractor is liable in every case where he has carelessly caused a dangerous condition to exist in a highway. It is fundamental law that every driver of an automobile must proceed cautiously, and there are many, many court decisions to the effect that one who rashly drives at excessive speed, or without proper lookout, along a highway has only himself to blame if he runs into a dangerous condition that would not have imperiled him had he driven with due care.

However, it behooves all contractors to be

sure that all hazards are properly and clearly marked, for it is obviously better to be over-cautious, than liable for a damage suit.

WANT TO PLACE CONCRETE EASIER, FASTER, AT LOWER COST?



SEND FOR THE STORY OF PUMPCRETE!

"How costs were cut in placing over 10 million yards of concrete" is a new book, just off the press, ready to bring you the complete and detailed story of the cost-saving ability of Rex Pumpcrete—the pump that pumps concrete! It answers all your questions about the design and application of this revolutionary concrete pump on underpasses, overpasses, bridges, viaducts, warehouses, buildings, sewage plants, reservoirs, where from 1000 to over a million yards of concrete were pumped in place at new low cost!

It gives full descriptions of the Rex 160 Pumpcrete with capacity up to 20 cubic yards per hour and the other Pumpcretes with capacities ranging all the way up to 65 cubic yards per hour. If you're after more concrete profits in '40, send for this book today.

Just send a card to the Chain Belt Company, Dept. PC11, 1666 West Bruce Street, Milwaukee, Wisconsin, and ask for the book: "How Costs Were Cut in Placing Over 10 Million Yards of Concrete." Your copy will come to you by return mail.

IT'S FREE!



BE THE WINNING BIDDER WITH

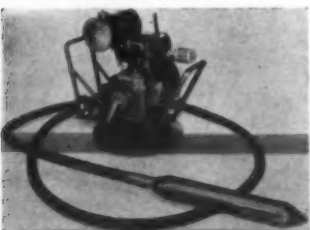
PUMPCRETE

THE PUMP THAT PUMPS CONCRETE

CHRISTMAS SEALS



Help to Protect Your Home from Tuberculosis



Concrete VIBRATORS AND GRINDERS

Write for Circular on types, sizes and prices

White Mfg. Co.

ELKHART

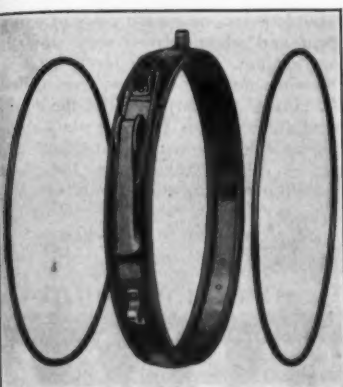
INDIANA

BUFFALO-SPRINGFIELD



3-AXLE TANDEM ROLLERS TANDEM ROLLERS
3-WHEEL ROLLERS TRENCH ROLLERS

THE BUFFALO-SPRINGFIELD ROLLER CO.
SPRINGFIELD, OHIO



The MineVent coupling for tunnel ventilating tube.

Ventilation Aid For Tunnel Jobs

A new aid to the installation of MineVent flexible pipe for tunnel ventilation is the patented MineVent demountable coupling which makes possible the purchase of tubing in economical long lengths and cutting it to suitable lengths on the job, the use of all small lengths, and provides a no-leak connection. MineVent couplers may be used with single or double-seam tubing, and are formed from strong 22-gage newly developed Zinc Grip rust-proof metal. The steel clamp actuates a drawbar of copper-coated steel wire. The rings are of oil-tempered spring steel wire, electrically welded. The coupler may be installed in a few moments and is available in sizes from 8 to 36 inches in diameter.

To join two pieces of tubing with one of these couplers, each end of the tubing is turned back about 3 inches over a coupler ring and the tubing smoothed out inside the cuff. Then the operator inserts each cuffed end of the tubing containing the ring into the unclamped coupler. After inserting the coupler drawbar in the proper slot, a slight pressure on the clamp lever completes the solid no-leak connection. To uncouple, the lever is released and the clamp pulled open.

Literature describing these MineVent couplers, as well as MineVent flexible tubing, may be secured by those interested direct from the American Brattice Cloth Co., Warsaw, Ind., by mentioning this item.

A.R.B.A. Proceedings

The *Proceedings* of the Thirty-Seventh Annual Convention of the American Road Builders' Association which was held in Chicago last January have now been published. The various reports, papers and discussions included in this volume cover, in some manner, practically every phase of the highway construction industry and profession. The various divisions of the Association reporting at the convention include airport, county, educational, highway contractors, manufacturers, municipal, Pan-American, planning and public relations. In addition, several special sessions were held, embracing the subjects of construction equipment, stabilization, diversion of highway transportation revenues, and highway safety.

Copies of this 893-page volume of the *Proceedings* may be secured by those interested in any phase of highway design, construction and maintenance direct from the American Road Builders' Association, International Building, Washington, D. C. Price: \$10.00.

Recent Dodge Appointments

The appointment of George W. Malcomson as Assistant Sales Manager of the Truck Division, Dodge Brothers Corp., was announced recently by Lee D. Cosart, Truck Sales Manager, who stated that expansion of the factory truck sales force coincided with the expecta-

tion by Dodge of substantially increased truck business during the 1941 model year.

Mr. Cosart also announced the appointment of L. M. Oltman, formerly regional truck manager in Chicago, as special truck representative of the factory truck sales force in Detroit.

Portable Batching Bin

A folder outlining the features of its 3-compartment portable batching bin, complete with weighing AggreMeter to meet any specifications, has recently been issued by the Erie Steel Construction Co., Erie, Penna. The bin is of all-welded steel construction, can be erected in one to two hours time with bin and top section as one piece or with top removed, and is durable but light enough to be handled in two sections with a small crane where necessary.

Complete information may be obtained by writing direct to the manufacturer and mentioning **CONTRACTORS AND ENGINEERS MONTHLY**.

STERLING BALANCED WHEELBARROWS



11/32" dia., continuous butt-welded rod in top edge of trays. Double thickness of metal at tray laps crimped over rod.

NO. S-18 CONCRETE BARROW WITH PNEUMATIC TIRE WHEEL

A COMPLETE LINE OF STERLING WHEELBARROWS AND CONCRETE CARTS

STERLING WHEELBARROW CO., MILWAUKEE, WIS.

"99"
THAT
CAN SURE
MOVE
SNOW!



GIVES US
AN "EXTRA
WORKING
MONTH" EACH
YEAR TOO..

● Throughout the snow belt, States, Counties and Cities are finding the A-W "99" their one best bet for quick, economical, dependable snow removal. No motor grader ever built even approaches the "99" Power Grader in its ability to handle snow. With powerful traction on the front wheels immediately behind the "V" plow, and with steerable rear wheels, the "99" bucks through the biggest drifts, overcomes side-draft, reduces skid hazards, and doesn't tend to slide into the ditch.

Superior snow fighting ability is but one of many of the "99's" outstanding advantages. The unmatched traction and directional control of this ALL-SEASON power grader adds

an "extra working month each year" because it moves more material farther and faster... will work efficiently in rough, wet or sandy ground where other motor graders cannot even go through with blade empty... and is in a class by itself on (1) ability to work on narrow, winding roads and around sharp curves; (2) work on steep slopes; (3) handle fine grading with speed and precision; and (4) operate attachments mounted both ahead and behind.

Write for full details, or call nearest A-W Distributor for a convincing demonstration. **THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois.**

Motor Graders
Loaders
Blade Graders
Elevating Graders
Hydraulic Scrapers
Crushing and
Screening Plants

Austin-Western

Cable Scrapers
Rollers
Roll-A-Planes
Motor Sweepers
Bituminous
Distributors
Shovels and Cranes

V
3
7
1
1

N
O
V

4
0

XUM



C. & E. M. Photo
Pneumatic tamping around a 30-inch vertical drainage pipe.

Aggregate Production For N.H. Dam Concrete

(Continued from page 12)

and 30 inches wide and driven by a 25-hp motor. This delivers the material originally to two double-deck vibrating screens measuring 4 x 12 feet each, with the top screen for 2-inch material and lower for 1/4-inch material. This was changed on July 12, 1940, to a three-decker screen with a 2-inch screen on top, the middle deck divided between a 3/8-inch screen and two 3/4-inch sections, and a 1/4-inch bottom screen.

At this point a large volume of water under high pressure is delivered through nozzles to wash the material thoroughly. Water for washing is furnished by a Gardner-Denver 1,500-gpm pump located in the river, delivering the water through a 10-inch pipe against a 100-foot head.

Rejects from the 2-inch screen are delivered by a 100-foot x 16-inch belt, driven by a 5-hp motor, to the gyratory crusher. The washed stone from 1/4-inch through 2-inch goes directly to the 210-foot x 18-inch stone conveyor, driven by a 15-hp motor, which delivers it at the top to a horizontal belt 100 feet long and 18 inches wide, driven by a 7 1/2-hp motor. This belt is equipped with an unloading device so that the stone can be stored in stockpiles below for rehandling by the same Barber-Greene loader installed for reloading sand from that stockpile.

Sand from the lower screen drops directly through a chute into a cone classifier so balanced that the valve at the bottom of the cone closes whenever the classifier is not full of sand. The dirty water and fines flow over the top to waste. The washed classified sand from the bottom of the cone is delivered to a 50-foot x 30-inch sand dewatering belt driven by a 5-hp motor. The first 10 feet of this belt are convex so that the water will run to the edge. Toward the end of this first section the belt flattens out and then for the balance of its length is concave as is usual for conveying belts. This belt delivers to the 210-foot x 18-inch sand stacker belt driven by a 10-hp motor.

During the early operation of the plant the stone was not sufficiently clean for use in the drains and filters so a 3-inch pipe made up with Dresser couplings was run from the 10-inch line up the stone conveyor trestle and across the horizontal stacker bridge to the final screens so that the stone could be washed a second time. This was dis-

pensed with when the 3-deck vibrating screen was installed at the top of the main conveyor belt.

This plant is also notable for its safety devices and safe construction. All of the walks, stairs and ladders are well protected by rails and are all of sturdy construction as well as being well illuminated by closely spaced lights with reflectors for night work. Emergency stop buttons are installed at easily ac-

cessible points near each piece of equipment and when pushed they stop the entire plant. At ground level, at about the mid-point of the main conveyor belt, the buttons for starting all of the equipment are installed. After the plant stops, a siren sounds when the first button is pushed to start any part of the plant. Since the cone classifier would continue to unload after the sand dewatering belt

(Concluded on next page)

The New KEYLODE Contraction Joint—



Highlights of this new joint:

1. A rigid, fully assembled unit, ready to be applied to subgrade. No dowel bars required.
2. The heavy plate allows uniform installation alignment of dowel plate.
3. The concrete slab edges are interlocked above and below the 1 1/2-gauge key-plate to transfer heavy traffic loads.
4. Economy in initial cost and lower installation cost, means a substantial saving over present dummy-joint methods.
5. The KEYLODE contraction joint, with 1 1/2-gauge plate dowel, also acts as a seal, and with the 10-gauge dividing plate held 1/8" below top of slab, eliminates the necessity of edging and filling top of joint.
6. KEYLODE contraction joints are furnished covered or skidproof, as may be specified, and are shipped painted and grouted. (To break bond.)

Write
HIGHWAY STEEL PRODUCTS COMPANY
Chicago Heights, Illinois
Birmingham, Alabama



THIS IS A NEW "CATERPILLAR" D-7 TRACTOR. AS IN OTHER TRACTORS AND OTHER CONTRACTORS' EQUIPMENT HYATT ROLLER BEARINGS WILL KEEP THEM YOUNG AND FULL OF LIFE.

Yes, Hyatts help your machines stay young . . . help them to make child's play of the toughest jobs! Hyatts insure smooth operation under all conditions at all times. For Hyatts are designed to banish friction . . . avoid wear and care . . . keep related parts in alignment . . . prolong machine life!

To assure far greater use from your contractors' equipment, make sure Hyatt Roller Bearings are a built-in feature. Hyatt Bearings Division, General Motors Sales Corporation, Harrison, N. J., Detroit, Chicago, Pittsburgh and San Francisco.

KEEP THEM YOUNG WITH HYATTS!

Copyright 1940, Hyatt Bearings Division, General Motors Sales Corporation

HYATT QUIET ROLLER BEARINGS

OUTSELLING ALL OTHER BRANDS IN AMERICA

WATERPROOFED



TARPAULINS

DISTRIBUTORS EVERYWHERE

Mfg. by

H. WENZEL TENT & DUCK CO.
1037 Paul St. ST. LOUIS, MO.

C. & E. M. Photo
A 1 1/2-yard

New Co
Fo

(Continued)

is stopped, the belt immediately shut down until loaded.

Four high-pressure pumps supported by two floodlights on each bank were installed, permitting the fill and rock

The major construction flood-control work which was completed by the Corp., of N.Y., cost \$4,265,000.

Description of the
Stripping dam at
Common excavator
301.0 M.S.L.
Common excavator
301.0 M.S.L.
Stripping borrow
and C
Excavation and
area A
Excavation and
area B
Excavation and
area C
Rock excavation
301.0 M.S.L.
Rock excavation
301.0 M.S.L.
Structure backfill
Structure backfill
Rolled fill, porous
Rolled fill, impervious
Rock fill
Hand-placed riprap
Derrick stone
Gravel for filter
5-inch gravel drain
Sand and filter
Line drilling for
drilling holes in
sure grouting
Drilling holes in
clams, and grouting
Pressure grouting
Concrete in
conduit transfer
piers
Concrete in concrete
Concrete in concrete
channel walls
and weir
Concrete in still
Reinforcing steel
Service bridge masonry
Wrought iron
bars
Cast-iron conduit
Gravel surfacing
Bituminous surfacing
roadway
Cobble gutters
Highway guard

The Great
of Chicago,
76,000 cu
This will be
a subsequent
ENGINEERS

The Frank
at Franklin
U. S. Eng
direction o
Lt.-Col. Le
Engineer,
dent Engin
Bishop and
dent Engin
Carbone i



C. & E. M. Photo
A 1 1/2-yard shovel loading gravel for processing into one of the 10-yard stretch trailer wagons.

New Concrete Dam For Flood Control

(Continued from preceding page)

stopped, it is necessary to start that immediately whenever the plant is shut down until the classifier has un-

Lighting

Four high lighting towers, each composed of two telegraph poles with cross arms supporting twenty-four 1,500-watt floodlights per tower, are placed two on each bank with the lights so turned as to illuminate the entire area at night, permitting 24-hour operations on the dam and rock excavation.

Major Quantities

The major quantities involved in the construction of the Franklin Falls flood-control dam, the contract for which was awarded to Coleman Bros. Corp., of Boston, on its low bid of \$4,265,000, are as follows:

Description of the Work	Quantity	Unit	Price
Excavation dam site	250,000 cu. yd.		\$.50
Common excavation above Elev. 301.0 M.S.L.	1,087,000 "		.22
Common excavation below Elev. 301.0 M.S.L.	739,000 "		.33
Excavation borrow areas A, B	215,000 "		.50
Excavation and haul borrow area A	300,000 "		.42
Excavation and haul borrow area B	550,000 "		.22
Excavation and haul borrow area C	185,000 "		.26
Rock excavation above Elev. 301.0 M.S.L.	315,000 "		1.45
Rock excavation below Elev. 301.0 M.S.L.	75,000 "		5.50
Structure backfill, uncompacted	10,000 "		.13
Structure backfill, compacted	12,700 "		.35
Gravel fill, pervious	1,952,000 "		.07
Gravel fill, impervious	300,000 "		.08
Rock fill	575,000 "		.15
Hand-placed riprap	13,200 "		3.00
Gravel for filters and backing	2,600 "		3.50
Gravel for filters and backing	115,000 "		1.00
Gravel for filters and backing	7,700 lin. ft.		1.00
Gravel for filters and backing	81,000 cu. yd.		.75
Gravel for filters and backing	68,000 sq. ft.		1.50
Gravel for filters and backing	5,700 lin. ft.		1.00
Gravel for filters and backing	3,000 "		.50
Gravel for filters and backing	2,300 cu. ft.		1.00
Gravel for filters and backing	87,000 bbl.		2.40
Concrete in intake structure, conduit transition, and bridge piers	18,000 cu. yd.		8.50
Concrete in conduits	8,800 "		18.00
Concrete in outlet approach			
Concrete in outlet approach	29,500 "		8.50
Concrete in outlet approach	18,500 "		9.90
Reinforcing steel	2,051,000 lb.		.83
Service bridge metal	160,000 "		.07
Trough iron and steel trash bars	169,000 "		.14
Cast-iron conduit liners	614,000 "		.08
Gravel surfacing for roadways	8,000 sq. yd.		.50
Gravel surfacing treatment for roadways	5,900 gal.		.13
Gravel surfacing treatment for roadways	2,300 lin. ft.		1.00
Gravel surfacing treatment for roadways	5,000 "		.70

Concrete Operations

The Great Lakes Dredge & Dock Co., of Chicago, Ill., is the subcontractor on 6,000 cubic yards of concrete work. This will be described in an article in subsequent issue of CONTRACTORS AND ENGINEERS MONTHLY.

Personnel

The Franklin Falls flood-control dam at Franklin, N. H., is being built by the U. S. Engineer Department under the direction of the Boston District Office, Lt.-Col. Leonard B. Gallagher, District Engineer, with H. C. Byrnes, as Resident Engineer, and W. P. Eaton, J. W. Bishop and E. H. Rice, Assistant Resident Engineers on the three shifts. F. A. Carbone is Office Engineer.

For the general contractor, Coleman Bros. Corp., of Boston, Mass., L. H. Huntley is Job Manager and R. L. Moore, Superintendent. For Sammons, Robertson, Henry, rock subcontractor of Huntington, W. Va., Lee Henry is in charge with M. O. Fowler as Superintendent.

H. H. Timken, Sr., Dies

H. H. Timken, Sr., Chairman of the Board of the Timken Roller Bearing Co. of Canton, Ohio, died at his home in Canton last month after a short illness. Although still active in the business which he founded with his father and brother in 1898, his two sons, H. H. Timken, Jr. and W. Robert Timken, have in recent years taken an active part in the management of the company.

Mr. Timken, who started his career as a lawyer, joined his father in founding a carriage and wagon-making business at St. Louis. Starting as a laborer, he worked his way up and shortly after his advancement to his position as Factory Manager, his father perfected the

principle of the Timken tapered roller bearing. When the father retired, his two sons realized that it would be only a matter of time until the "horseless carriage" would replace the wagons and carriages which the Timken organization was manufacturing. Anticipating the transition and realizing they were located too far from their source of supply and the potential automobile market, they moved the company to Canton in 1901. Since that time the company expanded rapidly under Mr. Timken's supervision.

H. H. Timken, Jr., has been elected to succeed his father.

New Bulletin Describes

Four-Wheel Scrapers

A 24-page fully illustrated bulletin describing the new Bucyrus-Erie 4-wheel scrapers has recently been issued by Bucyrus-Erie Co., South Milwaukee, Wis. The features of these scrapers, such as double-curve cutting edge, balanced weight, positive rolling ejection and controlled depth of spread, are discussed in detail with particular emphasis on the way each feature helps give dirt-movers fast time-cycles and more dirt. Low-maintenance factors such as simplified design, straight-line cable reeving and careful engineering are discussed, information on the use of the scraper as a finishing tool is given and the new Bucyrus-Erie power control units are illustrated and described. The bulletin concludes with a table of complete specifications on the four sizes of 4-wheel scrapers offered and illustrations of all the various machines in the Bucyrus-Erie tractor equipment line.

Copies of this bulletin may be obtained direct from the manufacturer.



"GET THERE
fastest
With "THE MOSTA
OF THE BESTA"

In that heading we give you the combined wisdom and experience of Nathan Bedford Forrest, the old Confederate raider, and Ben Bernie, the famous orchestra leader. Applied to the business of keeping highways clear of snow it means Keep the cuts open with plenty of AMERICAN SNOW FLOWS. AMERICAN Snow Flows are designed to give perfect trouble-free service. By utilizing the latest technique of electric welding we give our plows maximum strength with remarkable lightness. Use your trucks to push snow instead of a lot of excess weight in the shape of poorly designed snow plows. Write for catalog SNF-5 and let us tell you the whole story about AMERICAN Snow Flows.

AMERICAN HOIST
& DERRICK CO.

NEW YORK SAINT PAUL MINN. CHICAGO

AMERICAN TERRY DERRICK CO.

JOHN CRANE, N. Y.

for safe WIRE ROPE
FASTENINGS
genuine CROSBY CLIP

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue, New York

Enclosed is my remittance of \$2 for the next twelve issues of CONTRACTORS AND ENGINEERS MONTHLY.

Name.....

Position.....
(Or Type of Business)

Address.....

(City).....

N. B., A two dollar bill, check or postage stamps will be entirely acceptable.

TRUCK and BRAKE BLOCKS

Genuine CUSTOM-BILT

for Every Make, Year and Model.

Add up these advantages and see WHY GATKE Custom-Bilt Brake Blocks help Maintain tight schedules and reduce maintenance costs.

- Quality and Performance achieved through 25 years development.
- Correct type of material and correct friction for every brake, to give Powerful, but Smooth Stopping with long service and fewer adjustments.
- Uniform friction at all operating temperatures—No Fading—No Grabbing. Easy on Drums.

MAKE THIS TEST. Use GATKE Custom-Bilt Brake Blocks on your next five relines. Compare results—better brakes—lower maintenance costs.

Ask your GATKE Jobber or write us for complete information.

BRAKE BLOCKS : LIDERS

GATKE CORPORATION 228 N. La Salle St., CHICAGO, ILL.

V
3
7
1
1

N
O
V

4
0

XUM

Highway User Taxes Were \$1,252,205,000 in 1939

Highway users paid \$1,252,205,000 in direct taxes to state treasuries during 1939, according to data collected from state agencies by the Public Roads Administration. State gasoline taxes provided \$821,656,000, motor-vehicle fees \$412,494,000, and motor-carrier taxes brought in \$18,055,000.

The net funds distributed during the year amounted to \$1,226,916,000. Of this \$694,522,000 went for state highway purposes, \$301,885,000 for local

streets and roads, \$4,377,000 was assigned to forest and park roads, \$181,654,000 went to non-highway purposes, and the cost of collection amounted to \$44,478,000. The amount assigned to non-highway purposes was 14.8 per cent of the total funds distributed, as compared with 13.4 per cent for the previous year.

New Hydraulic Products

With increased production and construction appearing on the national scene, Blackhawk Mfg Co., Milwaukee,

Wis., makes a timely release of a new catalog describing products claimed to speed up construction operations, maintenance and production. These products include hydraulic hand jacks, gage-equipped jacks, wheeled floor jacks, high-pressure valves, remotely controlled jacks both hand-operated and motor-driven, hydraulic tools for maintenance and production, and hydraulic pipe and conduit benders. These products are fully described and illustrated and their applications given.

A copy of this catalog, No. 40H, may be obtained by writing direct to the

Industrial Supply Division of the Blackhawk Mfg. Co. and mentioning this item.

H. P. Mee Moves to Coast

H. P. Mee, Executive Vice President of the Cleveland Tractor Co., due to his extensive business interests on the West Coast, will in the future make his headquarters in Santa Barbara, Calif. Mr. Mee will continue to be closely affiliated with Cletrac as a director, and will be in charge of the company's interests in the Western Division which covers the seven western states.



BUS COMPANY FINDS ISO-VIS PAYS OUT

When all the engines in a Kansas public service company bus fleet had to be torn down to remove varnish deposits a Standard Oil representative decided that it was a good time to show this prospect what a Standard Automotive Engineer could do. He persuaded the fleet owner to call in one of these engineers.

As soon as the engines were operating, the engineer made various tests including pyrometer readings of crankcase temperatures, etc. From the information he obtained he determined that because of the severity of the operation Iso-Vis Motor Oil should be used. Recently one of the engines was inspected after 60,000 miles of operation on Iso-Vis. Not a trace of varnish or sludge was found.

Why not call in one of these Automotive Engineers before trouble develops? He can help prevent as well as cure many of the ills that afflict fleet equipment.

TRUMAN L. FLATT SAYS HIS COSTS WERE CUT 30%

Operating costs can get out of line quickly in the fleet of bituminous distributing trucks operated by Truman L. Flatt, Springfield, Ill. Each truck has two gasoline engines, one of which operates a large part of the time at idling speed to



keep the asphalt circulating in the truck tank.

A large part of the saving which Mr. Flatt reports was made by the Automotive Engineer on these auxiliary engines. With his instruments the engineer located carburetion troubles and corrected them. Adjustments were accurately made, which not only gave more economical operation, but assured trouble-free service on the job.

In summing up the results, Mr. Flatt writes:

"I am very well pleased with the saving shown in fuel and lubricating costs, and this, together with the services performed by your Automotive Engineer, has enabled me to reduce my operating cost as much as thirty per cent in the last year."

HERE'S WHERE YOU'LL FIND YOUR STANDARD AUTOMOTIVE ENGINEER...

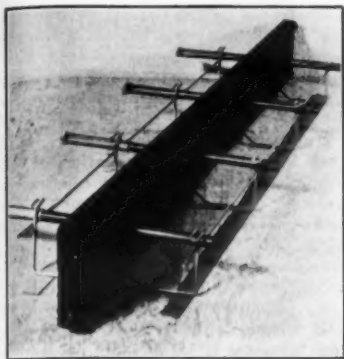
Billings, Montana
Chicago, Illinois
Davenport, Iowa
Decatur, Illinois
Denver, Colorado
Des Moines, Iowa
Detroit, Michigan
Duluth, Minnesota
Evansville, Indiana

Fargo, North Dakota
Grand Rapids, Michigan
Green Bay, Wisconsin
Huron, South Dakota
Indianapolis, Indiana
Joliet, Illinois
Kansas City, Missouri
LaCrosse, Wisconsin
Mankato, Minnesota
Mason City, Iowa

Milwaukee, Wisconsin
Minneapolis, Minn.
Peoria, Illinois
Quincy, Illinois
Saginaw, Michigan
St. Joseph, Missouri
St. Louis, Missouri
South Bend, Indiana
Wichita, Kansas

Why not have one of these engineers explain fully just what he does to help make these savings? A card to your local Standard Oil (Indiana) office or to 910 South Michigan Avenue, Chicago, Illinois, will reach the engineer you want. In Nebraska, call or write Standard Oil Company of Nebraska at Omaha. Just say, "We'd like to have your Standard Automotive Engineer call."

STANDARD OIL COMPANY (INDIANA)
AUTOMOTIVE ENGINEERING SERVICE **LOWERS MILEAGE COSTS**



The Qwik-Lock joint and dowel assembly.

Dowel Assembly Unit For Highway Joints

The dowel bars commonly used and approved by the Public Roads Administration and the state highway departments for transferring a load from one paving slab to the next can function properly only if they are held parallel to the line of motion of the adjacent slabs. To accomplish this, they must be placed and held parallel to each other, to the subgrade, and normal to the joint filler material.

Among the units available for this purpose is the Union Qwik-Lock joint and dowel assembly unit in which the dowel bars are positively locked in their proper position so that any amount of reasonable handling or job usage can not dislodge them from that position. These units are used to assemble all joint materials at a central plant and then are distributed along the side of the work at the joints, ready to be placed on the subgrade when the pouring has progressed to that point.

Literature containing further information on these Union joint and dowel assemblies, as well as samples, may be secured by interested contractors and highway engineers direct from the Union Steel Products Co., Albion, Mich.

New Lubricating Guns

Heavy-duty Airline Lubriguns, designed to dispense lubricants directly from the original 400-pound refinery drums, have recently been added to the line of lubricating equipment manufactured by the Lincoln Engineering Co., 5701 Natural Bridge Ave., St. Louis, Mo. These units are available in high, medium and low-pressure models. The high and medium-pressure units will handle all types of lubricants, ranging from heavy viscous to light fluid greases, and the low pressure models dispense all grades of fluid lubricants and lubricating oils.

Further information on these new Lubriguns may be secured by interested contractors and state and county highway engineers direct from the manufacturer by mentioning this item.

Cable-Control Scrapers

Three four-wheel cable-control scrapers of 15, 20 and 25-cubic yard capacities are made by the Road Machinery Division, Gar Wood Industries, Inc., Detroit, Mich.

Model 515, with a 15-yard heaped and a 12-yard struck capacity, is designed for use with 80 to 105-hp tractors. This model has a wheelbase length of 19 feet $\frac{1}{2}$ inch, an overall length of 31 feet $\frac{3}{4}$ inches and an overall width of 11 feet $\frac{5}{8}$ inches. The inside bowl width is 10 feet, the digging depth below the tires up to 12 inches, the depth of spread above the tires up to 24 inches, and a bowl clearance when raised for hauling of 24 inches. The apron opening is 48 inches. Standard tire equipment is 13.50 x 20 single tires in front and dual tires in the rear. Optional tires are 18.00 x 24 singles in front and singles or duals in the rear.

Model 520, with a 20-yard heaped and 15.8-yard struck capacity, is designed for use with 95 to 105-hp tractors with a pusher. It has a wheelbase length of 19 feet $\frac{1}{2}$ inches, an overall length including the drawbar of 31 feet $\frac{1}{2}$ inches, and an overall width of 11 feet $\frac{5}{8}$ inches. The inside bowl width is 10 feet, the digging depth below the tires up to 12 inches, the depth of spread above the tires up to 25 inches, and a bowl clearance, when raised for hauling, of 25 inches. The apron opening is 54 inches. It is equipped with 18.00 x 24 single tires in front and duals in the rear.

Similar in construction to the Model 520, Model 525 is somewhat larger. With a 25-yard heaped and 19.3-yard struck capacity, its wheelbase is 20 feet $\frac{1}{2}$ inches, the overall length 32 feet $\frac{1}{2}$ inches, and overall width 11 feet $\frac{5}{8}$ inches. Its inside bowl width, digging depth below the tires, apron opening and tire equipment are the same as the Model 520, while its depth of spread is up to 26 $\frac{1}{2}$ inches and the bowl clear-

ance also 26 $\frac{1}{2}$ inches.

In addition this company makes 2-wheel hydraulic scrapers of 3, 5, 6 and 8-yard sizes and 4-wheel hydraulic units of 8, 10, 12, 15 and 20-yard sizes. Literature describing and illustrating any or all of these scrapers may be secured direct from the manufacturer.

New Drilling Machine For Truck Mounting

Compact and of all-steel construction, the No. 82 Speed Star drilling machine made by the Star Drilling Machine Co., Akron, Ohio, has an electric-welded main frame only 13 feet long, with main sills 12 inches deep, and is designed for mounting on any standard truck chassis.

The Speed Star can be placed on the job and put into action quickly. The mast is raised by power and the upper section latches automatically. Guy lines are furnished already connected to the top and lower sections. With the stakes and stake eyes regularly furnished,

anchoring the mast and rigging up is a matter of minutes only. The sturdily built mast telescopes, can be used at either 40 or 50-foot heights, and is built for a safe working load of 15,000 pounds.

Another feature of this unit is the air cooling of the bull reel and sand reel brakes. The weight of the brake lever alone is usually enough to keep the reel from slipping when spudding. The double-crank spudder has a built-in shock absorber, with recoil control, and is adjustable to various weights of tools. All controls on the No. 82 are conveniently placed within easy reach of the operator. The three reels, bull, sand and calf, have instantaneous reverse. Of extra large spooling capacity, these reels are fast, free-running and equipped with movable dividers. Two speeds on the bull reel provide for swabbing and other heavy jobs besides ordinary work.

Power for this new drilling machine is furnished by a Hercules 6-cylinder gasoline engine Model QXB, with a $\frac{3}{4}$ -inch bore and $\frac{4}{5}$ -inch stroke.

WORTHINGTON AIR TOOLS



WJ-60
Rock
Hammer



WJ-45
Rock
Hammer



W-85
Pavement
Breaker



WSD-85
Sheeting
Driver



W-19
Clay
Digger



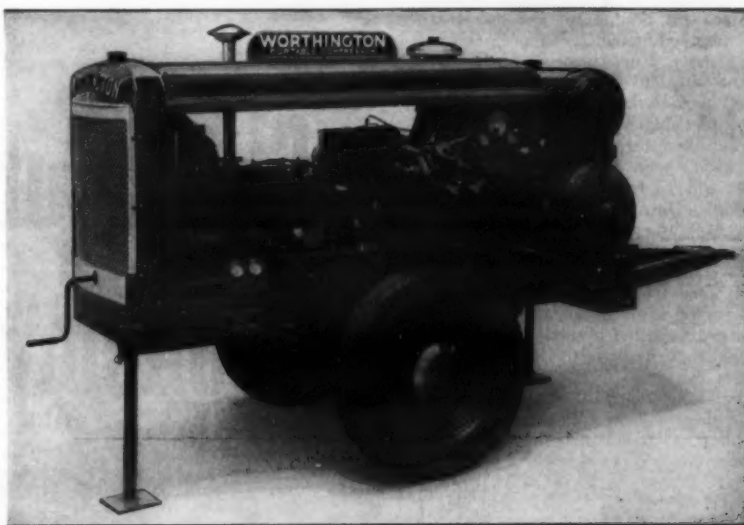
W-16
Trench
Digger



W-8
Backfill
Tamper



Rock Master
Wagon Drill



Worthington Model 60 two-stage air-cooled portable compressor, on two-wheel pneumatic tire spring trailer with standard equipment

WATCH Worthingtons Work

ON roads, bridges, dams, dikes, trenches, tunnels . . .
wherever you need air . . . watch Worthington Portable

Compressors. You'll see power and capacity combined with unusual smoothness, a smoothness due largely to the famous Worthington Patented Feather Valve. You'll see why a Worthington is unequalled as a source of low cost air.

A complete line includes sizes from 60 to 315 cu. ft. actual capacity . . . gasoline, Diesel and electric drive . . . and with all types of mountings.

Every Worthington Compressor is equipped with

WORTHINGTON FEATHER VALVE UNITS

Simplest . . . lightest . . . most efficient valve yet devised for compressor service.



WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: HARRISON, NEW JERSEY - District Offices or Representatives in Principal Cities

WORTHINGTON



PCO-7

Digging a County Out of the Drifts

(Continued from page 1)

including all travel from the garage and return.

Plowing is started when about 3 inches of snow has fallen and is continued 24 hours a day with the same men on the trucks, allowing only sufficient time to have the trucks checked and refueled. Each of the trucks, which are powered with 200-hp engines, is equipped with an auxiliary fuel tank to permit 24-hour work. The men averaged 17 hours per day on snow plowing for the entire month of February, 1940, and they work on monthly wages the year around with no overtime. All of the men take great pride in their equipment and do not want to have relief operators on their trucks. Over one half of the men have been working on the same snow-plowing routes since 1926. In case of a breakdown, which is infrequent because of the excellent equipment maintenance system in Onondaga County, a new piece of equipment is sent out and the other equipment hauled back to the shop for repairs.

The big Walter trucks are equipped with Heil hydraulic dump bodies, which are loaded with big stones from the county quarry for ballast during snow plowing. The wings are all power-operated while the V-plows are part power-operated and part by hand pumps. One crew, which had experienced some trouble with motor traffic from behind it not noticing the wing on the truck, installed a small automobile spot light on the body to illuminate the back of the wing.

There is a great deal of trouble with ice on the roads in Onondaga County. The state sands all state highways so that the county is required to take care of only its own mileage of roads to fight the ice hazard. It has eight self-powered Good Roads sanders in which sand with 45 pounds of calcium chloride per ton is used. This treated sand is stockpiled all over the county. Local residents are employed to distribute the sand over the road in particularly bad spots and the self-powered sanders are used only on long stretches. These local residents are paid 75 cents an hour for a man and his truck and 40 cents an



Laying back the tops of high drifts and plowed snow with the wing of a Walter Snow Fighter travelling with traffic.

hour for a helper. The hours are checked by the local section men.

The county owns 200,000 feet of vertical slat snow fence which is put up in the early autumn and removed in late April, being stored in the Jamesville and North Syracuse yards during the summer.

Finances

The County Board of Supervisors of Onondaga County, in accordance with state laws, appoints the County Road Superintendent from a civil service list with the approval of the State Department of Public Works. Raymond B.

Traver, the present County Superintendent of Highways, has been with the county highway organization since 1911 and since 1922 has been appointed County Superintendent of Highways for 4-year terms.

The funds available for the fiscal year 1938-39 for the operation of the Onondaga Highway Department were as follows:

County Funds from General Taxes.....	\$ 350,000
Refund by State from Motor Vehicle and Gas Tax	575,000
Special County Appropriation for WPA Widening Project	100,000
	\$1,025,000

The normal appropriation from general taxes was \$600,000, but economies in appropriations cut the sum nearly in half. In addition to the funds mentioned above, the county received about \$15,000 from the state for snow removal on state highways. This amounts to about \$50 per mile while the actual cost was \$209. In the winter of 1939-40 the County Board made three emergency appropriations for snow removal,

(Continued on next page)

Short Cut TO Economy



• Many a truck operator, after trying first one make then another, has standardized on Ford equipment. Others do it much sooner. They start with Ford Trucks and never change.

• If you're in the market for a new truck, take the short cut to economy. Get a Ford. And with it, get a brand-new idea of savings. Ask any Ford dealer about an "on-the-job" test.



FOR '41-PUT A FORD TO WORK!



1941 FORD TRUCKS

FORD MOTOR COMPANY, BUILDERS OF FORD V-8 AND MERCURY CARS, FORD TRUCKS, COMMERCIAL CARS, STATION WAGONS AND TRANSIT BUSES

PALMER

Asbestos-Metallic
MOLDED BRAKE
and FRICTION
BLOCKS

Do
YOUR
Brakes
and Clutches
break the record

for speed, sureness, stamina and economy? They WILL, if you use PALMER Blocks and Brake Linings on all your trucks, power shovels, cranes and hoists. Many shapes. Many sizes.

Write for
Circular



Here's
the
address:

PALMER

Asbestos & Rubber
Corporation, 180 North
Michigan Ave., Chicago, Ill.

Here's Truck Value!

- ★ Choice of 2 Improved V-8 engines—85 or 95 hp.
- ★ New 4-cylinder super-economy engine, optional in Commercial Cars and 122-inch trucks.
- ★ Beautiful modern styling—an important asset to your business.
- ★ Rugged, dependable full-floating rear axles in all trucks. $\frac{3}{4}$ -floating in Commercial Cars.
- ★ Improved rear springs (main and auxiliary) on Regular and C.O.-E. Trucks for heavy duty.

(Continued from preceding page)

The Jamesville Shops

```

graph TD
    CSOR[COUNTY SUPERINTENDENT OF ROADS]
    CSOR --- SPETW[SURVEYS  
PLANS AND  
ENGINEERING  
OF  
TOWN WORK]
    CSOR --- SPCCR[SURVEYS  
PLANS AND  
ENGINEERING  
OF COUNTY  
ROADS]
    CSOR --- SMM[SHOPS,  
MASTER  
MECHANIC]
    CSOR --- OAC[OFFICE,  
ACCOUNTING,  
CHIEF CLERK]
    SPETW --- GSCM[GENERAL SUPERINTENDENT  
OF CONSTRUCTION  
AND MAINTENANCE]
    SPCCR --- GSCM
    SMM --- GSCM
    OAC --- GSCM
    GSCM --- DISTRICTS
    DISTRICTS --- D1[1]
    DISTRICTS --- D2[2]
    DISTRICTS --- D3[3]
    DISTRICTS --- D4[4]
  
```

Organization diagram of the Onondaga County Highway Department.

Use of Recorders on Equipment

Each piece of equipment, such as graders, shovels, and trucks, and also the door on the oil house, is equipped with a Servis recorder. This device is a small clock-like affair, containing a pendulum which is actuated by the mo-

(Concluded on page 43)

Other features of Jackson vibratory paving tubes include the dual tube fully submerged vibratory elements; the variable frequency of from 3,000 to 5,000 vibrations a minute; simple construction; and finger-tip controls. Each of the two elements has a powerful sub-

Jackson Vibrators, Inc., Ludington, Mich., manufacturer of this unit, will be glad to send its literature containing further information on this vibrating unit direct to readers of this magazine, upon request.



**For greater dragline yardage
use a Page Bucket on the job!**



Dragline buckets for all types of work • Capacities $\frac{3}{4}$ to 15 cubic yards

There's a reason why more Page Dragline Buckets are used than any other make. By their yardage records on all types of work, Page Buckets have established a reputation of being able to outdig

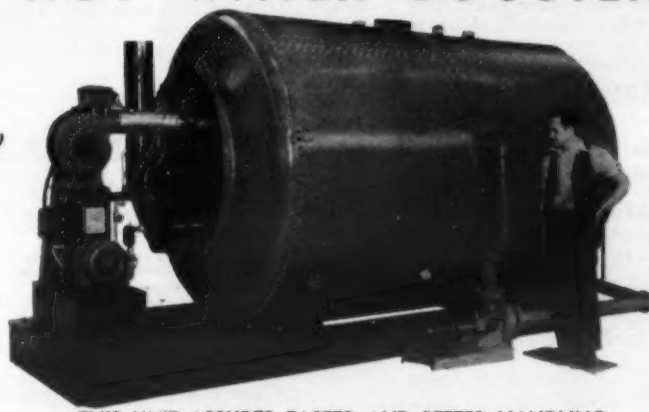
other buckets of equal size and weight. Get the greatest yardage possible from your dragline machine—dig with a Page Automatic Bucket! See your equipment dealer or write us for more information.

PAGE ENGINEERING COMPANY

Page Automatic Dragline Buckets • Page Walking Dragline Machines
CLEARING POST OFFICE, CHICAGO, ILLINOIS

THE CLEAVER HOT WATER BOOSTER

*—Provides an ample supply of **HOT WATER**— automatically and economically for central mixing plants.*



THIS UNIT ASSURES FASTER AND BETTER HANDLING OF CONCRETE MIXES UNDER ADVERSE FALL AND WINTER WEATHER CONDITIONS.

Write for illustrated brochure

CLEAVER-BROOKS COMPANY
3112 W. Center Street. Milwaukee, Wisconsin

Care of Equipment In Field and Garage

(Continued from page 21)

to state-owned heavy equipment.

Three equipment trailers are owned by the Department for moving shovels from one location to another and for hauling disabled equipment to the central garage for repairs. The Department owns 89 power shovels, from small tractor-mounted units to 1/2-yard shovels.

The roster of motor trucks is not as great in the Maine Highway Department as in many states of comparable mileage as most trucks needed for light work are hired locally. The major portion of the heavy-duty trucks are used for mounting 600, 1,000 and 1,200-gallon bituminous-distributor tanks. The 1,200-gallon units are mounted on sixteen all-wheel-drive trucks. While some of these trucks are used only for distributors and hence can be overhauled during the winter season, those which are converted to snow-removal units are overhauled at the end of the autumn bituminous-surfacing program and the snow plow frames and plows attached immediately at the State Highway Garage. Some of the smaller distributors are mounted on 2-wheel-drive trucks which are not used for any other service. The maintenance program which requires such an extensive fleet of distributor trucks, with 2,000-gallon semi-trailer tank units, will be described in a subsequent issue of CONTRACTORS AND ENGINEERS MONTHLY.

The Highway Garage

The State Highway Garage was built in 1920, on Capitol Street, Augusta, and has since been considerably rebuilt to facilitate the work carried on. It consists of a shovel shed, the main garage, 75 x 150 feet, with a basement, main floor and loft, and the 2-story converted storage garage, 205 x 50 feet.

The shovel shed is used during the winter for the overhauling of shovels and during the balance of the year for minor repairs to heavy equipment, and for the storage of a unique piece of utility equipment built in the shops. An obsolete truck chassis which was no longer suitable for road work was used as a basis of a general utility crane built with the cable drums from an old tractor shovel and a welded double boom of 4-inch pipe. The boom has a three-quarter swing and will handle remarkably heavy loads except over the side. In the shovel shed is a large tank for the use of a vapor system for the rapid removal of heavy deposits of grease and dirt from engines and parts. In this same building are two presses, one of 60-ton capacity, and the other of 200 tons, which are used chiefly for removing shovel gears and sprockets from shafts.

The Main Garage

On the ground floor of the main garage is a large clean toilet and wash room for the mechanics. Well distributed around the main floor are specialty departments, each fully equipped to handle a particular kind of work. The Bearing Shop, set off by a light frame enclosure, is equipped with a valve facing machine, a connecting-rod boring bar and a main line boring bar.

In one corner is the Machine Shop which is equipped with a radial drill press, a piston grinder, two 16-inch lathes, one 14-inch and one 26-inch lathe, a heavy planer, a turret lathe, a shaper and a milling machine. As an economy in machine maintenance, this department buys many of its castings rough and either does the machining in this shop, or in the case of gears, for which it is not equipped, the work is let to local shops on a piece basis.

Around the edge of the entire ground floor of the main garage are work benches for each of the mechanics. Neatly tucked in just below the ceiling of the main garage and the converted storage garage are five 150-gallon rectangular lubricant tanks which formerly stood on the floor and occupied much needed space. A simple direct piping system leads the four grades of lubricants from these tanks to padlocked spigots over a porcelain sink which catches all drippings. Adjacent to this is a 10 x 12 stationary compressor providing air at 100 pounds pressure for shop use.

The basement of this garage is used for storage.

The Salvage Department

Located in a loft above the main floor of this garage is a Salvage Department which has great potential value. Used hand equipment, chains, and even carburetors, magnetos, nuts, springs, and all other used parts of any piece of equipment are sent to this department. Each unit is carefully gone over to see if it can be economically repaired, the work is done on it and it is placed ready for re-issue on requisition. Old battered lanterns are thus again made available for service, batteries and magnetos are carefully checked and placed in stock for reuse and even inner tubes are checked to see if they will stand repatching and deliver additional service on the original investment. Friction bands for shovels which are found to wear out rapidly are relined and placed in stock ready for use. This "second hand stock room" is a recent idea and is already paying dividends.

The Converted Storage Garage

The section of the garage, at right angles to the main garage, and which was also built in 1920 as a storage garage, was rebuilt in 1939, and the lower ground floor was converted into a shop with numerous specialty activities. The equipment includes a solid tire press which itself is almost ready to be retired, two forges operated by blacksmiths who are kept busy continuously, a heavy bending floor and a drill steel sharpener. In this shop the steel wheels from old graders are machined and equipped with pneumatic tires very economically. Further equipment includes a shear and punch, a drill press, two grinders, an acetylene welding outfit, four electric welders and a power saw. A stock rack for convenient storage of shaft steel, tubing and iron is built in one corner of old I-beams and metal from too many sources to be enumerated here.

Another corner of this converted garage is used as a radiator repair shop, where radiators from every type of internal combustion engine are gone over, cleaned and made available for further

service. Adjacent to this is a general utility saw table with a band and circular saw which furnishes pre-cut timber for all of the work needed in the garage, and along the wall is a bench where various types and sizes of air compressors are repaired.

On the second floor of this new shop is the very complete stock room of new parts and materials. It is kept locked at all times and is completely surrounded by a heavy wire partition. Manila card stock tags, Form BT, are located at every bin and aid in maintaining the perpetual inventory necessary to the efficient operation of the repair department. A material elevator is located just outside the stock room and is most convenient for raising the heavy loads of large and small parts from the ground floor of the main garage to the upper floor of the converted garage where the stock room is located.

Located in a loft above the stock room is the Sign Shop where two men are kept busy all year laying out and hand painting all of the special signs required by the Department. Special signs, such as those for the Moosehead Trail which involved the careful painting of the head of a large moose, are also produced here. The standard Federal and state route signs of enameled iron are stored under the eaves in the Sign Shop.

The office of the Superintendent of the Garage and the clerks is located at the junction of the ground floor of the main shop and the lower floor of the converted shop. At the far end of the converted shop is the paint storage room where thousands of gallons of paint in 5-gallon containers is stored ready for requisition and immediate use.

Personnel

Charles Davis, Superintendent of the Garage, has been with the Equipment Maintenance Division since this garage was built in 1920, working first as a

mechanic in the garage, then as the traveling Master Mechanic inspecting equipment all over the state, and more recently has been in charge of the garage and shops.

With the intensive activity of the construction season over, use your time this winter to study the new models, in order to bring your equipment up-to-date ready to start work next spring.

RED DEVIL LIGHT and POWER PLANTS 800 to 50,000 WATTS



3,000 WATT
as illustrated
on
\$395.00
Pneumatic Tires

Finish the job quicker and save money with electricity.

Send for catalog describing generators and our complete line of portable poles for floodlighting.

E. B. KELLEY CO., Inc.
43-57 Vernon Blvd.
Long Island City, N. Y.



NEW CONSTRUCTION—REPAIR

There is work to be done—we are on the march again and the huge armaments program calls for a lot of new construction . . . airports, cantonnments, highways . . . as well as repair work on existing projects.

Galion enters into this picture nicely . . . and especially where precise compaction of material is the demand. A complete line of rollers for any kind of job. The tandem and portable are shown here already at work on exacting jobs.

Tandem rollers—three models with variable weight from 5 to 14 tons. Portable rollers—variable weight from 7500 to 10,000 lbs. Also 3-wheel and sheepsfoot rollers; motor and pull type graders.



The Galion Iron Works & Mfg. Co.
Main Office and Works: Galion, Ohio

PILE HAMMERS and EXTRACTORS HOISTS-DERRICKS WHIRLERS

Special Equipment
Movable Bridge Machinery

Write for descriptive catalogs.

McKIERNAN-TERRY CORP.

19 Park Row, New York

Distributors in Principal Cities

Hauling Over M

The Lock J. N. J., is now of subaqueous daily in the C it 14 miles to is to be insta Ohio, water s is 24 feet long eter and 132 and weighs ap

The pipes at the manufact dock by truck pulled by a with a Cummin whole unit ru and Goodyear 10.50 x 24, six 8.25 x 15 tires on this unit is form load pounds per ti for a load pounds each only highway of Lake Erie is solely of a w it was decide load the tires their capacity would be no d

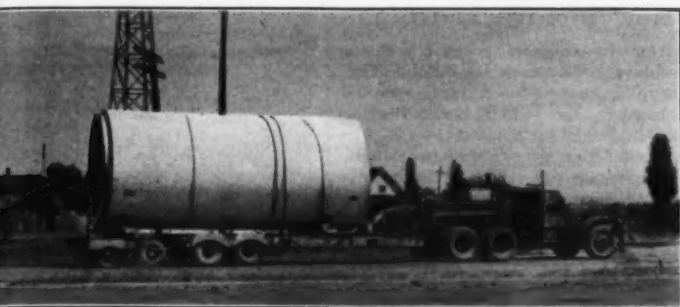
Portable

The new q nounced by t Minneapolis, from the quar ceiving hoppe feeder with r over a grizzly going to a 15 undersize to passes under t er also discha which deliver vertical rotor- uct to the mai the 4-foot x 8 vibrator scre the screen to thence to the while the over inch x 20-in back by a be rotor-lift for screen.

This plant pneumatic ti and can be f triple-deck s Power is sup diesel engine an auxiliary e

Four

Three new a new air g announced b matic Tool C Chicago, Ill. all-around gr the three new 6-inch light-d 7-inch heavy completely er and free from models are of tion-run typ



24-foot long 132-inch diameter reinforced-concrete pipe mounted on a Jahn trailer for its 14-mile journey from manufacturing plant to job.

Hauling 57-Ton Pipe Over Macadam Roads

The Lock Joint Pipe Co., of Ampere, Wis., is now manufacturing 120 feet subaqueous reinforced-concrete pipe in the City of Toledo, and hauling 14 miles to Lake Erie where the pipe is to be installed in the new Toledo, Ohio, water supply system. Each pipe is 24 feet long, 108 inches inside diameter and 132 inches outside diameter, weighs approximately 57 tons. The pipes are being transported from manufacturing plant to the loading dock by truck, using a Jahn trailer pulled by a Sterling tractor powered by a Cummins diesel engine. The trailer unit runs on forty-two Firestone Goodyear tires consisting of ten 30 x 24, sixteen 9.75 x 15 and sixteen 15 x 15 tires. The loading of the pipe on this unit is so arranged to give a uniform load of approximately 3,200 pounds per tire. These tires are good for a load of approximately 6,000 pounds each, but due to the fact that the highway from the plant to the shore of Lake Erie is a county road consisting largely of a waterbound macadam base, it was decided that it would be best to limit the tires to only about one-half their capacity so to be sure that there would be no damage to the road bed.

Portable Quarry Unit

The new quarry plant recently announced by the Diamond Iron Works, Minneapolis, Minn., receives rock direct from the quarry shovel dipper to the receiving hopper. A 30-inch x 5-foot apron feeder with manual control discharges rock to a grizzly screen, the oversize rock going to a 15 x 24 jaw crusher and the undersize to the belt conveyor which carries under the jaw crusher. This crusher also discharges to the belt conveyor which delivers all material to a large vertical rotor-lift that elevates the product to the main conveyor for delivery to a 4-foot x 8-foot single deck Diamond roller screen. Sized material passes through the screen to the hopper below and on to the delivery belt conveyor. The oversize is discharged to a 26-inch x 20-inch roll crusher and then carried by a belt conveyor to the vertical rotor-lift for recirculation over the screen. This plant is equipped with dual automatic tires and mechanical brakes and can be furnished with a double or triple-deck screen and chip eliminator. Power is supplied by a 90 to 100-hp diesel engine mounted overhead or from auxiliary engine.

Four New Grinders

Three new electric bench grinders and one new air grinder have recently been announced by the Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill. Substantially built for around grinding and buffing service, the three new Thor bench grinders, in both light-duty, 6-inch heavy-duty and extra heavy-duty models, have motors completely enclosed, cool, quiet running and free from vibration. The first two models are of the split-phase start induction-run type and the 7-inch of the

tion, the No. 255 air grinder is but one of a complete line of Thor grinders for every type of grinding service. These range in weight from 18 ounces to 24 pounds; in length from 5½ to 39 inches; and in capacity from 1½ to 8-inch diameter wheels.

Literature on these models of Thor grinders may be secured direct from the manufacturer by mentioning this item.

P & H Personnel Changes

Announcement has been made by the Harnischfeger Corp., Milwaukee, Wis., of the appointment of R. D. Holcomb as Sales Manager of the Large Excavator Division, handling 1¾ to 5-cubic yard machines. Mr. Holcomb was formerly District Manager of the Memphis territory where he has been succeeded by Lee M. Cauble.

G. K. Woodling, formerly of the Sales Department, has been transferred to the Engineering Division for P & H small excavators, ranging from ¾ to 1½ cubic yards in size.

Clearing Roads of Snow

Blocked roads, too tough for push plows, can be opened, widened and cleared to the shoulders by the Snow King rotary plow according to the manufacturer, the Rotary Snow Plow Co., Minneapolis, Minn. The Model 883 Snow King rotors are driven from an auxiliary power unit carried on the rear end of the truck, leaving the truck engine free to control the road speed and keep the rotors continuously at full capacity according to the depth and condition of the snow. The V point pierces and feeds the snow to the rotors which cut and discharge the snow by centrifugal force. The discharge is straight up and is deflected in either direction by chutes to take advantage of any wind.

A new catalog, Form 1086, recently issued by this company, effectively illustrates the Snow King in action and gives complete construction data and specifications. Copies may be obtained direct from the manufacturer by mentioning this item.

SHUNK SCARIFIER SAW-TOOTH BLADES

CUT THRU WHERE OTHERS STALL

Use these blades where you previously have had to use a scarifier. Get the even distribution, possible only with a blade, yet penetrate the hard surfaces. Increase the usefulness of your motor graders, bulldozers, under-truck-maintainers, road drag, snow plows and other maintenance units. No extra parts are required; you simply replace the blade you are now using with a Shunk Saw-Tooth Blade. Made in varying sizes, with angle and spacing of teeth according to the work to be done. Blades with two cutting edges are available in any combination of saw-tooth or plain edges for DOUBLE DUTY. Here is big profit for a small investment—write at once for complete information on practical uses and prices.

SHUNK MFG. COMPANY
BUCYRUS, OHIO, U. S. A.

HEIL
Road Machinery helps you make even the toughest jobs pay profits

Heil's complete Road Machinery line includes the right unit to make your tough jobs profitable ones. Popular dirt-movers that load fast, dump fast, cut and spread accurately, turn in a short radius, hitch and unhitch easily. These dependable Heil advantages help many contractors to operate at a profit. Let them help you do top-quality, clean-cut work — and make money. Equip yourself with Heil Dig-N-Carry Scoops, Trailbuilders and Bulldozers . . . Send today for free catalog.

"Yes—we get both wet and dry batches from this BLAW-KNOX CENTRAL MIXING PLANT. It gives us both mixed concrete and dry batches for compartment trucks or truck mixers."

No matter how varied and involved the concrete requirements on your job might be—Blaw-Knox will design a Central Mixing Plant to solve your problems economically.

Stationary or floating plants, manual or automatic in operation, have been furnished for hundreds of jobs. See them in Catalog No. 1566.

BLAW-KNOX CENTRAL MIXING PLANTS
BLAW-KNOX DIVISION
OF BLAW-KNOX CO.
Farmers Bank Bldg. Pittsburgh, Pa.

THE HEIL CO.
MILWAUKEE, WISCONSIN HILLSIDE, NEW JERSEY

Above: Heil Hydraulic Scoops cut dirt-moving costs to the bone. Below: Streamlined, Heil Cable Scoops dig, carry, and dump big payloads.

Heil Scoops — Hydraulic Scoops — Motor Scoops — Trailers
Heil Trailers — Trailbuilders — Trailblades — Trailblades — Trailblades

V
3
7
1
1

N
O
V

4
0
XUM



A multi-level aggregate stockpile and batching plant and the Heltzel bulk-cement plant serving the fleet of truck mixers.

Speedy Concrete Paving On 6-Mile Ohio Project

(Continued from page 15)

bank-run gravel with no stone larger than $\frac{3}{4}$ inch and with sufficient soil to bind the material when rolled. This blanket course is 19 inches thick at the bottom edge of the pavement and thickens at the rate of $\frac{3}{8}$ -inch per foot across the pavement to the low side.

Beneath the ditch for the length of the cuts is plain concrete pipe 8 inches in diameter with 6-inch laterals under the blanket course. In all cuts throughout the job the subgrade was scarified 8 inches deep, then respread and rolled with a 10-ton Galion roller. The same roller was used to roll the subgrade, whether it had a blanket course or not, ahead of any work in cutting the form trench and for a distance 18 inches outside the slab. The form trench was cut with a Cleveland Formgrader, preparing it for the 9-inch Jaeger steel road forms which were set by two form setters each with a helper, followed by two men lining up and driving the pins. Then one of them operated the Jaeger-Lakewood power-driven form tamper to insure a solid foundation under the base of the forms. At times when the subgrade was too hard for the R-B Finegrader a Galion heavy-duty hydraulic power grader was used to scarify the grade to loosen it up. One man behind the Finegrader filled in any holes and cleaned out against the forms, leaving a uniform subgrade to be rolled with a Galion 5-ton 3-wheel roller. A crew of four men with a Heltzel scratch template and mattocks, for use where the grade was tough and still high, did the final work in leaving a uniform smooth grade for the thickened-edge slab. French drains were inserted in the subgrade, as directed by the Engineer, to correct wet spots which were discovered during the preparation of the grade for paving.

Joints and Reinforcing

Non-extruding expansion joints were placed every 120 feet in the slab with contraction joints mid-way between the expansion joints. The expansion joints are comprised of Philip Carey Elastite encased in thin sheet metal with two keys on each side. The joint material proper is $\frac{3}{4}$ inch wide and the keys permit expansion of the material into the air spaces without extruding at the top. These expansion joints were set without caps $\frac{1}{2}$ inch from the top of the pavement and are pierced by nine $\frac{3}{4}$ -inch smooth round dowels 16 inches long on 15-inch centers across the slab with caps on one end and the dowels oiled from end to end. Particular care is taken in Ohio that there be no lip on the end of the dowels from the shearing to cut them to proper lengths.

Special care was taken to lift the screeds of the finishing machine over each expansion joint and, when they were vibrated with the Master vibrator

which was used on both sides of all joints and along the road forms, care was also taken to prevent the creation of pockets of mortar at the joints. The finishers straight-edged over the joint and then cut them with a long lipped edger, leaving the mortar between the two edges. This was easily removed the next day, even when hard, by a tooth on the end of a stick run across on top of the expansion joint material. Following this the joints were poured with an asphalt filler.

The contraction joints have the same dowel assembly but without the expansion joint material. A slot was cut over the center of each contraction joint and a $\frac{1}{8}$ x $2\frac{7}{8}$ -inch ribbon inserted flush with the top of the pavement. This was not edged by the finishers.

As the 22-foot pavement was poured as two 11-foot slabs, hook bars were inserted in the first slab poured in a special key-way 1 inch deep and 3 inches wide maximum. The $\frac{5}{8}$ -inch hook bar 12 inches long with a female thread in the end was placed in the key-way when the first slab was poured and also held the block of wood forming the key. When the forms were pulled, corks were put in the female sleeve to protect the holes from getting filled up with dirt during curing. After the subgrade was prepared for the adjacent slab, the key-way of the first slab was painted with two coats of hot asphalt, Ohio Specification F-2, heated in a Littleford asphalt kettle, and then the corks were removed and a second hook bar $\frac{5}{8}$ inch x 8 inches with a male thread was screwed into place, making a firm bond for the two slabs. These bars were spaced 5 feet apart.

The reinforcing used in this contract was composed of Type A mesh fabric consisting of transverse No. 5 gage steel wires spaced 12 inches center to center and longitudinal No. 2 gage steel wires spaced 6 inches center to center. The mats are 4 inches narrower than the lane width. The reinforcing was placed 2 inches below the top of the slab by striking off the concrete at that depth on the first spreading of the concrete as delivered to the slab.

(Concluded on next page)

New Sheave Bearings

A modification in the design of the Standard NA type non-adjustable Timken roller bearing has recently been announced by The Timken Roller Bearing Co., Canton, Ohio. Made up of a double-row outer race or cup and two single-row inner races or cones, it is especially adapted to serve as a sheave bearing.

The races and rolls are ground to established precision limits so that when the cones are assembled into the cup the front faces of the cones are in contact and the proper running clearance is provided. The front cone faces are slotted and chamfered to provide an entrance for lubricant to within the bearings. This feature is said to be particularly advantageous in multiple sheave blocks where it is required that the bearings be lubricated through the pin which is stationary. In some sheave blocks, lubricant may be introduced through a fitting in the sheave hub, and for this design an annular groove and holes are provided in the cup.

The problem of sealing the bearing chamber has been greatly simplified by extending the length of the large cone rib and creating a surface concentric with the shaft and sheave bore on which a seal may be run. These seals have the same O. D. as the cup and are pressed onto the sheave bore and thus are used to hold the bearing together during assembly. The backface of the cones must protrude slightly outside the seal to establish clearance between the sheaves and the frames of the block.

The bearings are designed to a minimum width and with an I. D. large in relation to its O. D. and also with a maximum radial and thrust capacity for the space occupied. Being an anti-friction thrust bearing as well as a radial bearing, the sheaves may rotate freely without axial float. As the tapered races of the two rolls are directed one towards the other, the result is a bearing of extreme rigidity, thus preventing wobbling of the sheave, according to the manufacturer.

Crawler Tractor Catalog

A catalog with a new and unusual approach has recently been issued by the Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee, Wis., and is devoted to its new HD7 diesel crawler tractor. Stressing performance to do the job and protection against lost time, this 24-page 2-color catalog emphasizes the five main features of this 54-hp tractor, namely, 2-cycle diesel power, balanced

power and speed, bi-metallic clutches and brakes, new track release mechanism and Positive-Seal truck wheels.

Copies of this catalog may be obtained by those interested direct from the manufacturer by mentioning CONTRACTORS AND ENGINEERS MONTHLY.

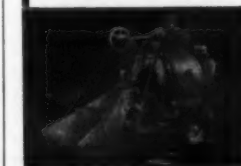
GRAND CHAMP CMC 10" SELF-PRIMER PUMPING 240,000 G.P.H.



Exclusive Twin Priming Doubly Fast— Doubly Sure!

CMC Dual Prime—brings new speed to water handling. Sizes for every type of work—from $1\frac{1}{2}$ " to 10". Modern, unclogging, 100% Automatic priming. Also Triple Prime Well Point Pre-Drainage and High Pressure Pumps.

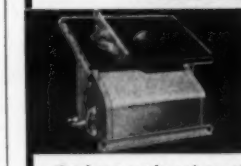
Always In The Lead With Money-Making Equipment!



CMC
2-Wheel
End Dis-
charge
Trailer. Big
output—fast
moving. In
SS, 75, 105,
145 sizes.



CMC
HOISTS
Safety plus
efficiency.
Sizes up to
40 H. single
or double
drum.



CMC
Kest Kutter
Saw Rigs in
Sr. and Jr.
models.
Also heavy
duty Power
Sawyers.

Get latest catalog of complete CMC line.

Construction Machinery Co.
Waterloo, Iowa

LARGE CAPACITY
Low Power Costs and Upkeep.
Complete Safety

**Bronze or Roller Bearing
JAW CRUSHERS**

Heavy Armor plate
steel or cast steel con-
structed. Large capac-
ity. Small power Re-
quirements. Many sizes
built—stationary or
portable to meet your
requirements.

"Since
1885"

YOU can DEPEND on

GRUENDLER EQUIPMENT

GRUENDLER
(CRUSHERS - MIXERS - GRINDERS)

For All Type Roads Whether
Mountain or Farm to Market
or State Highway

FREE!
Write Today for
16-PAGE
ILLUSTRATED
CATALOG
and
SPECIFICATIONS

Four Wheel Maintenance
JAW CRUSHER with
Power Unit.

**GRUENDLER CRUSHERS &
PULVERISERS CO.**
2917-27 N. Market St., St. Louis, Mo.

Are
ROCK
HANDLING
PROBLEMS
ever yours

AN OWEN GRAPPLE will furnish THE SOLUTION

SPECIAL jobs often require special tools and while rock handling problems are doubtless common to many, OWEN has perfected and proved the special tool for this job in the Type RA Rock Grapple. Revolutionary, independent line action, enormous lifting capacity and other exclusive features distinguish it decidedly from other equipment intended for like use.

Write for the new catalog, just off the press.

The OWEN BUCKET Co.

6830 BREAKWATER AVE., CLEVELAND, OHIO
BRANCHES: New York, Philadelphia, Chicago, Berkeley, Calif.



C. & E. M. Photo
A "chug-chug", and the ground under the road form base was packed firmly by this Jaeger-Lakewood tamper.

Truck-Mixers Pour Slab on Ohio Road

(Continued from preceding page)

Pouring and Spreading

With the Jaeger side-dump 3-yard truck mixers running outside of the forms when pouring the first slab and running on the concrete when pouring the second slab, they teamed up well with the Jaeger spiral spreader which quickly took the material from the chute at one side of the slab and moved it across, evening it up by reversing the screw where necessary. The spiral spreader was set 2 inches below the top of the forms for the initial spread so that the welded reinforcing mats could be placed at the proper elevation, and then it was lifted to the top elevation on the second time over for spreading the surface concrete. This spreader carried the Master vibrator which was used along the forms and all joints.

The truck mixers were so timed that there was usually one 3-yard truck mixer waiting as another was delivering its batch to the subgrade. In this way maximum mixing was insured and there was no delay in the operation of the spreading and finishing equipment.

Finishing

As soon as the spreader had placed the surface concrete a Jaeger-Lakewood double-screed finisher completed the machine surfacing. When the finishing machine was working with a double-flange wheel on a road form and a flat wheel on the first slab poured, one man worked ahead of the finisher cleaning the concrete so that it would furnish a uniformly smooth surface for the flat wheel of the finisher. Then, inasmuch as some concrete was bound to be worked over onto the first slab by the second screed, another man was kept busy cleaning the slab so that the two finished 11-foot traffic lanes would have a uniform appearance on completion.

The contraction joints were cut immediately behind the finishing machine by a Flexible Road Joint Machine Co. machine running on 4 wheels. It was operated by two men who inserted the ribbon in a straight line across the pavement and then floated over it.

This operation was immediately followed by careful straight-edging of the concrete with a Cleveland 10-foot aluminum straight-edge followed by the dragging of burlap over the surface where it checked properly. Two hand finishers edged the sides of the pavement and the expansion joints, followed by one man broom-marking the surface with a 2-foot long-handled fibre broom.

Careful Curing

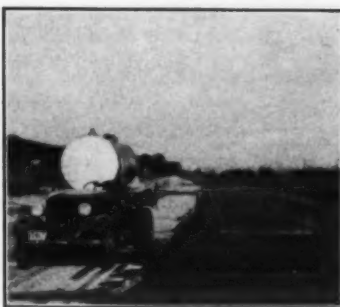
Immediately behind the broom-marking, two men spread wet burlap

across the pavement in double thickness. The burlap was wetted by "dunking" in metal drums filled with water by the 800-gallon tank truck which was a very versatile piece of equipment. It was equipped with a valve and hose so that it could fill the water barrels, which were spotted at convenient intervals along the pavement, and then it had a 13-foot sprinkler bar on one side which could be folded back of the truck and which was used to sprinkle the grade ahead of paving and also to sprinkle the burlap for 24 hours after it was spread on the concrete. We don't mean "maybe" when we say that the burlap was wet, for it was thoroughly wet down at frequent intervals during the day and all night after spreading so that it was soaking wet at all times.

After the burlap had been on the concrete surface for 24 hours it was removed, the sprinkler truck wet the surface thoroughly, and then 60-foot rolls of Sisalkraft paper 13 feet wide, rolled on 2 x 4's, were laid out on the pavement with added 2 x 4's about every 30 feet and other timber at intervals along the side and with dirt along all edges to seal in the moisture. This paper was left on for 72 hours minimum and removed when the average of two test beams showed a modulus of 600. Between the removal of the burlap and the placing of the Sisalkraft paper the pavement was checked thoroughly with a bumpometer and all bumps greater than the allowed $\frac{1}{4}$ inch in 10 feet were removed.

Personnel

The 6.176-mile grading, drainage and 22-foot reinforced-concrete pavement contract, running eastward on U.S. 52 along the Ohio River from the Brown-Clermont county line, was awarded to Crumley-Jones & Crumley of Cincinnati, Ohio, on its low bid of \$478,976.49. Warren Hopkins was Superintendent for the contractor, and Joseph W. Vollmar was Project Engineer for



C. & E. M. Photo
The tank truck ran in reverse when sprinkling the burlap—quite a trick over long distances.

the Ohio Department of Highways, of which Robert S. Beightler is Director.

Clutch and Brake Facings

Velvetouch Bimetallic friction material is an all-metal material for clutch and brake facings and its use, according to the manufacturer, largely eliminates the delays due to the wearing out or burning out of conventional materials. In addition, Velvetouch is said to provide smooth action which eases the

strain on other working parts and prolongs their useful life as well as its own.

Complete information on this material is contained in a new bulletin, Form 52539, copies of which may be obtained direct from the S. K. Wellman Co., 1381 E. 49th St., Cleveland, Ohio. This company maintains an engineering department to cooperate with users and manufacturers of equipment in developing the design and material best suited for the machine.

Line of Metal Forms for Concrete Construction

Catalog 7, recently issued by Binghamton Metal Forms, Inc., Binghamton, New York, describes its line of Hotchkiss forms. These include road forms, highway gutter forms, shoulder and alley forms, culvert header forms, curb and gutter and sidewalk forms, and steel forms for concrete manholes. Construction features are clearly explained and illustrated, and instructions for ordering are given.

Copies of this catalog may be obtained by those interested direct from the manufacturer by mentioning this item.

Easy Dumping—Easy Running

The F-4 $\frac{1}{2}$ Barrow is built for easy loading or dumping, correct width for hoists, deep tray for wet concrete or mortar, never-slip axle 16" wheel with ball bearings.



LANSING COMPANY

LANSING, MICHIGAN

Chicago New York Philadelphia Kansas City
San Francisco Boston Minneapolis Los Angeles

Pneumatic Tire

Better Construction Profits

"Our ROGERS TRAILER with A BIGGER LOAD THAN A RAILROAD CAR COULD CARRY"

TO limit the usefulness of Rogers Trailers to HEAVY loads is a mistake. Bulky but comparatively light loads are often particularly fitted to this type of vehicle. Dimensions of parts to be handled are also a factor.

For example, consider the eight 60" reinforced concrete pipes, a total of only 20 tons. The Harrison Construction Co. of Pittsburgh, Pa. wrote, "The oddity of this load is not so much the weight as the bulk. This trailer carried a bigger load than a railroad car can haul, due to the extreme diameter of the pipe."

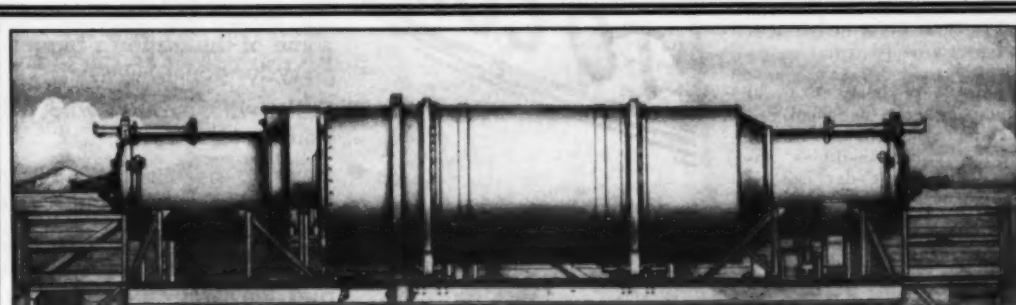
Write for information on Rogers complete line.

EXPERIENCE built it — PERFORMANCE sold it —



ROGERS BROS. CORP.

108 Orchard St., Albion, Penna.



SIMPLICITY ALTERNATE HOT OR COLD MIX DRYER

THE HIGHEST PRICED DRYER ON THE MARKET . . .

. . . BUT THE COST TO YOU IS LESS . . .

SAVINGS IN FUEL COST ALONE WILL PAY THE ENTIRE COST OF A SIMPLICITY DRYER

DEPENDABLE THE SIMPLICITY SYSTEM COMPANY
CHATTANOOGA, TENNESSEE



J. C. Compton's planer at work near Oregon City, Ore., showing the heating element mounted in front to soften the pavement.

New Type of Planer For Asphaltic Roads

A new method of treating badly worn and roughened asphaltic road surfaces has been developed by O. O. Davis of Oakland, Calif., and J. C. Compton, of McMinnville, Ore. This new piece of equipment, called a planer, has been patented and is being built by a company formed by Mr. Davis and Mr. Compton and being operated as the Asphalt Planing Co., 1924 Broadway, Oakland, Calif., and McMinnville, Ore. Thus far, the machines have not been manufactured for sale but have been operated by the company on a rental basis, a considerable amount of work having been done in California and, more recently, for the Oregon State Highway Commission, notably on some asphalt road at Grants Pass and between Oregon City and Clackamas.

The propelling element of this planer is a standard-type Caterpillar Patrol. In place of the ordinary blade, however, is suspended a rectangular steel burner-box element which travels with the edges close to the surface of the road. Back of the burner box, controllably mounted, is a special type of blade for planing a 4-foot strip of surface. This blade, barely $\frac{1}{4}$ inch in thickness, is made of highly tempered special alloy steel and represents the cutting element only. For strength and rigidity it is mounted on the edge of a heavier steel block.

Heat confined in the burner box softens the asphalt to a consistency proper for the planing operation. In principle, this is all there is to the rig, except that back of the planer is drawn a grader, the blade of which acts to push the planed-up material over to the shoulder.

The work at Oregon City was done under the supervision of E. A. Collier, Division Engineer of the Highway Commission, and W. M. Strohmeyer, District Maintenance Superintendent. On this job the cuttings from the machine were deposited in a trench on the shoulders at the edge of the pavement while still warm and workable, giving an additional width of 24 inches to the pavement. The surface left by the planer is smooth and fresh, and may be left as is or provided with a non-skid surface, as deemed advisable.

The rig moves very slowly, 20 to 30 feet a minute, and one flag man can easily maintain traffic around it at all times. Under average conditions, approximately 0.40 mile a day can be planed. This means three complete rounds a day over a 0.40-mile stretch of 16-foot highway, allowing for a slight over-lapping of the 4-foot width of the

planer blade. In case of a very rough surface or exceedingly rich asphalt, there may be the necessity for a double pass in some places, although this is not ordinarily the case.

On this job, the rental price of the planer was \$12.50 an hour, the owner furnishing the operator, all gas and oil.

The State furnished a motor patrol, a pull grader, a truck, and five men. An

average of 0.40 mile of 16-foot pavement was planed per day at a total cost of \$335.00 a mile.

Two Personnel Changes At Wire Rope Company

The John A. Roebling's Sons Co., Trenton, N.J., has announced the appointment of Roger H. Clapp, formerly Philadelphia Branch Manager, as Assistant General Manager of Sales, and Earl N. Graf, formerly Pittsburgh Branch Manager, as Assistant Manager of Sales, Wire Rope Division.

Mr. Clapp gained his first knowledge of the wire business with the American Steel & Wire Co. and with Wickwire Spencer Steel Co. In 1936 he joined the Roebling organization as Manager of its Philadelphia Branch.

Mr. Graf came to Roebling in 1938 after having served in various capacities with the Carnegie Steel Corp., the Midvale Cambria Steel Corp., and since 1919 as wire rope specialist with the Frick-Reid Supply Corp.

**FORM WORK AND
RICHMOND
ARE SYNONYMOUS**

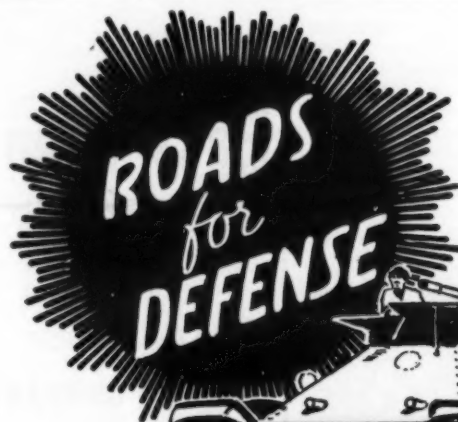
ON BIG CONCRETE JOBS

They're Saying...
*"tie faster with
Richmond Ties"*

See "Sweet's" 3-51.

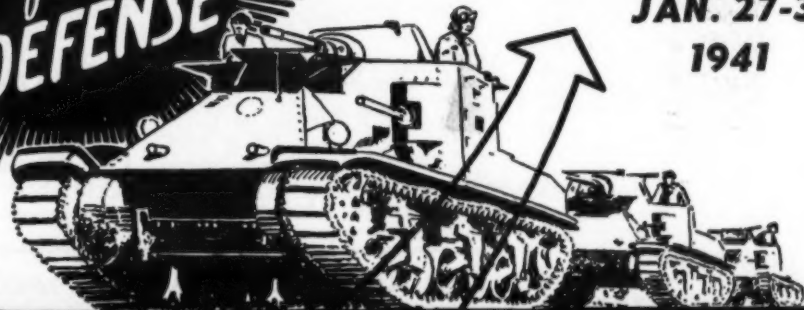


RICHMOND SCREW
ANCHOR CO., INC.
838 Liberty Ave.,
Brooklyn, New York



38th ANNUAL CONVENTION

JAN. 27-31
1941



Pennsylvania Hotel, New York City
AMERICAN ROAD BUILDERS ASS'N

**PLAN NOW!
TO COME!**

- Never before an opportunity like this!
- A program designed to help you.
- A chance to hear authorities on all phases of Roads for Defense—and we mean authorities—some of the nation's biggest men with a real practical story for you.
- Talks with experts who will discuss subjects close to your pocket books.
- Intimate discussions in clinic assembly where you can secure the actual answers to your questions.
- Taxes — Airports — Express Highways — Interregional Roads — Traffic Analysis and How to Apply it — Snow and Ice Control — Cutting the Cost of Overhead — The Effect of War on Roads!
- These and many other topics are going to be discussed by men who have found the answers.
- Learn how to make defense dollars do more work.
- Plan now to be there.

AMERICAN ROAD BUILDERS ASS'N
International Building . . . Washington, D. C.

COMPLETE WELL POINT SYSTEMS

WILL DRY UP ANY
EXCAVATION

Faster—More Economically

Write for Job Estimate and Literature

COMPLETE

MACHINERY & EQUIPMENT CO., Inc.

Dept. C

36-40 11th St., Long Island City, N.Y.

Tel. IRonsides 6-8600



The McCaffrey tractor shovel on a D4 Caterpillar tractor.

New Tractor Shovel With Front Loading

A tractor shovel, made for mounting on any make of tractor and with power control over the dumping and relatching operations of the bucket, has been announced by M. P. McCaffrey, Inc., 2121 East 25th Street, Los Angeles, Calif. A Rudomatic cable winder is the feature giving this control over dumping and relatching.

As will be noted from the illustration, the load is placed fully on the truck frames of the tractor, eliminating the need for counterweight because the weight of the attachment is distributed by means of the triangular construction of the side frames and the placement of the power take-off and cable reel at the rear. Inasmuch as there is no tower, cylinder or power take-off in front, the operator's vision is not obstructed.

The bucket is as wide as the tracks, making it possible for the operator to clean up flush against walls and banks. The 1-yard bucket can be raised to give a clearance of 7 feet for loading into high-bodied trucks and it has shown an ability to handle 75 cubic yards of material per hour.

Complete information regarding this new McCaffrey tractor shovel may be secured direct from the manufacturer by mentioning this item.

Welding Blow Pipe, Cutting Attachment

A new medium-pressure oxy-acetylene blow pipe for welding light-gage metal and a cutting attachment for cutting iron and steel up to 1 inch in thickness have recently been announced by the Linde Air Products Co., a Unit of Union Carbide & Carbon Corp., 30 E. 42nd St., New York City.

The blow pipe, known as the Prest-O-Weld Type W-109, is specially designed for welding in light production work in which metals up to 3/8-inch thickness are to be joined. Both valves are conveniently located at the forward end of the handle where they can be readily adjusted. "A" size screw-type hose connections facilitate connecting and disconnecting the blow pipe. There are eight sizes of welding heads, each with an individual mixer.

The Prest-O-Weld Type CW-109 cutting attachment attaches directly to the blow pipe handle in place of the welding head. One of its features is an improved cutting valve with rubber-seated stem, and a cutting valve lever that can be turned back 90 degrees to permit ready access to the cutting valve assembly, and for easy connection to and dis-

connection from the blow-pipe handle. Two cutting nozzles are supplied, No. 0 which cuts up to 3/4-inch steel or iron, and No. 1 which will cut up to 1 inch.

Protective Coating For Metal and Wood

A durable protective metallic coating for iron, steel and wood, which is applied like a paint and seals the surface with a sheet of metallic copper, has been developed by CopperCote, Inc., 331 Madison Ave., New York City. Although applied with a brush or by spraying or dipping, CopperCote is not a paint but a liquid composition with fine particles of pure metallic copper held in suspension, providing any surface to which it is applied with an anti-corrosive non-scaling non-checking coating. It is quick-drying and quick-hardening and is unaffected by temperature.

In addition to standard CopperCote, there is also a special type of coating known as Marine CopperCote for use on surfaces under water, such as piling, piers, and similar structures, which is resistant to the ravages of the teredo and other destructive marine life as well as to the deteriorating effect of water. Another product of this company is Leafal, an aluminum coating. This is made in two types. Type A is an all-purpose aluminum coating of durability and lasting brilliance, according to the producer, and Type B is a heat-resisting and baking coating, for applications where heat is a problem. There is also a line of colored aluminums.

Among the many uses of CopperCote, Marine CopperCote and Leafal are the protection of steel bridges, trestles, towers, pipe lines, all types of equipment exposed to the elements, water tanks, fencing, and any other structure of metal or wood requiring protection against weathering and deterioration. Further information on these products may be secured direct from CopperCote, Inc., by mentioning this item.

Hauling Costs Calculator

To assist contractors, engineers and others interested in earth-moving problems to compute rapidly probable production for cost estimates and analyses, the Field Engineering Department of R. G. LeTourneau, Inc., has prepared a simple handy slide-rule calculator based on exhaustive time studies and compila-

tion of extensive job data.

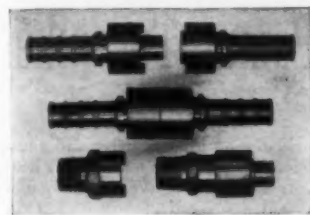
With the calculator you can answer quickly all questions on probable performance by LeTourneau Carryall scrapers powered by Caterpillar tractors, including optional units as well as the most recent D7, and by the Model A Tournapull. Production can be computed over any grade or haul distance, and provision is made for average speeds of as high as 40 mph.

This estimating instrument may be secured free of charge by writing direct to Field Engineers, R. G. LeTourneau, Inc., Peoria, Ill.

New Hose Couplings

A new line of cast bronze hose couplings for joining similar or dissimilar sizes of rubber hose on air, water, steam and gas lines operating up to 200 pounds pressure per square inch has been announced by the Pittsburgh Brass Mfg. Co., 3269 Penn Ave., Pittsburgh, Penna.

In addition to quick opening and closing features, Fuline hose couplings

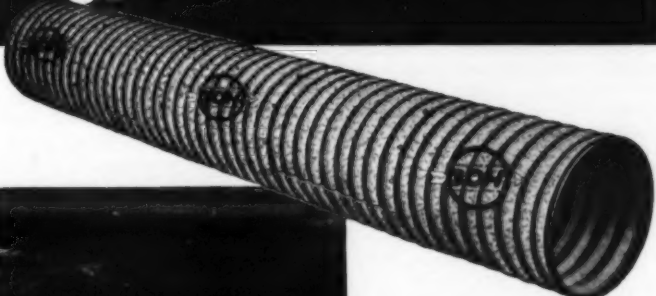


The new Fuline hose couplings.

employ a positive locking device, thus providing increased safety for workmen. When a connection is made, there is no chance of the lock spring escaping from the sleeve and causing an accident. Standard sizes are available for 3/8, 1/2 and 3/4-inch hose and large sizes can be made to specifications.

The illustration shows male and female Fuline hose couplings ready for connection and also connected, as well as male and female pipe ends which are also made by the Pittsburgh Brass Mfg. Co. which will be glad to send complete information upon request.

LOOK UNDER THE SPELTER COATING

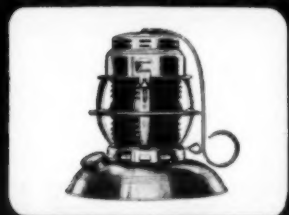


to determine pipe quality

On the surface all corrugated pipe looks pretty much alike, but down under the spelter coating the real story of endurance is written . . . in the base metal itself. It is there that GOHI Pipe, by long odds, shows its unexcelled superiority because GOHI Pure Iron-Copper Alloy is the longest-lasting, low-cost ferrous metal, its stamina proved by more than thirty years of outstanding service in the ground. To use GOHI Pipe is to eliminate a major problem in highway construction—the permanence of the drainage structure.

New England Bolt Co. . . Everett, Mass.
Central Culvert Co. . . Ottumwa, Iowa
Capital City Culvert Co. . . Madison, Wis.
Bancroft & Martin Rolling Mills Co. . . S. Portland, Me.
Denver Steel & Iron Works Co. . . Denver, Colo.
The Lane Pipe Corporation . . . Bath, N.Y.
Dixie Culvert Mfg. Co. . . Little Rock, Ark.
St. Paul Corrugating Co. . . St. Paul, Minn.
The Newport Culvert Co. . . Newport, Ky.

AT LAST... A REAL WARNING LANTERN



EMBURY Traffic Gard

- ★ With Fresnel Safety-Beam Lens
Novel Adjustable Bail
Broad Non-Tipping Base
- ★ Burns over 72 hours on one filling.
- ★ Strong, Storm-Tested, Wind Proof.
- ★ A one-purpose lantern specifically designed to give you

BETTER PROTECTION AT LOWER COST

Embury Mfg. Co., Warsaw, N.Y.

GOHI Pipe meets Copper-Bearing Pure Iron requirements of all specifications published by nationally recognized specifying authorities.



72-page illustrated book on use of GOHI Pipe in modern drainage is yours for the asking. Address nearest fabricator.

GOHI CULVERT MANUFACTURERS, INC., NEWPORT, KY.

Carey Elastite
EXPANSION JOINT
Standard in Concrete Construction for 25 Years
ECONOMICAL and EFFICIENT
Asphalt Joint • Rubber Joint
Non-Extruding Expansion Joint
Plate Dowel Expansion Joint
Sub-grade Felt
THE PHILIP CAREY COMPANY
Dependable Products Since 1873
LOCKLAND CINCINNATI OHIO

Penna. Turnpike

(Continued from page 17)

It melted soon after sunrise and caused no trouble. By the time the really heavy mountain snows arrive, the organization will be ready to attack in full strength.

Under the head of emergency equipment with the snow-plowing units are the six combination fire and tow trucks located at the seven tunnels, one unit serving Blue Mountain and Kittatinny. Four of the trucks are equipped with two 3-ton booms for handling wrecked cars and other lifting service, and two have 6-ton booms. Along with the towing equipment are lashing chains and towing arms, sledges, cutters, jacks and a 20-pound fire extinguisher of the CO₂ type for flash fires, and also foam-producing equipment, fire hose, tanks for water, etc. Inhalator equipment, 24 first-aid kits, stretchers, gas masks, asbestos uniforms and blankets, and burn kits are also provided. Each of the six trucks has an extension ladder mounted on a turntable which is useful in gaining access to different parts of the tunnels and in servicing tunnel-approach and interchange lighting equipment. Standard lighting is provided on each truck, including four red blinker lights and two spot lights.

A Salute to the Staff

The staff of faithful engineers of the Pennsylvania Turnpike Commission deserves the greatest possible credit for the remarkable engineering feat which they have accomplished in starting from scratch and in 23 months producing this remarkable 160-mile super-highway with its seven tunnels and 307 bridge structures. Not only have they created the designs for every structure but they have guided the best endeavors of the corps of contractors, who must share in the credit for this great enterprise for setting new records in tunnel and paving construction, as well as for rock and earth excavation, but now the same engineers have turned their attention to the proper maintenance and operation of the completed project.

It is a credit to the engineering profession as a whole and to this determined group in particular that in changing from a seasoned design and construction organization to a green operating unit they have made the shift with so little loss of efficiency and with such complete satisfaction to the traveling public which uses this new traffic utility.

Personnel

The 160-mile Pennsylvania Turnpike was built by the Pennsylvania Turnpike Commission, an autonomous commission created by the Legislature of Pennsylvania. A total of \$70,050,000 was expended for the construction of the super-highway, \$29,250,000 of which was received as a grant from the Public Works Administration, and \$40,800,000 of Commission bonds were purchased by the Reconstruction Finance Corp. to pay the balance.

Construction of the Turnpike began on October 28, 1938, and it was opened to toll traffic on October 1, 1940, with

tolls varying from \$1.25 for automobiles and passengers up to \$10 for the most heavily laden trucks with full trailers.

Walter A. Jones is Chairman of the Pennsylvania Turnpike Commission, with Frank Bebout (deceased), Charles T. Carpenter, Thomas J. Evans, and I. Lamont Hughes, Secretary of Highways, as members, and John D. Fallor, Executive Secretary and General Counsel. The engineering staff is composed of Samuel W. Marshall, Chief Engineer; Richard M. Merriman, Chief Tunnel Engineer; and Roger B. Stone, Chief Construction Engineer. James F. Murphy was Project Engineer for PWA; Col. F. F. Lamphere, Inspection Engineer for the RFC; and Thomas C. Frame, Chief Engineer for the Pennsylvania Department of Highways. J. E. Greiner Co. of Baltimore was Consulting Engineer.

A Bucket Loader for Handling Small Material

The Jeffrey Mfg. Co., Columbus, Ohio, recently published a catalog on the Jeffrey Junior bucket loader, Type 211-A. According to the manufacturer, this is an inexpensive, light-weight mechanical loader for handling crushed stone, sand, gravel and other small loose material, not to exceed 3-inch pieces. The buckets are adjustable to unevenness of ground and pick up the material without any hand shoveling. One man can easily operate this machine, which has a capacity of 35 tons or more per hour and is available equipped with electric motor or a gasoline engine.

Complete description, general specifications and price are included in this catalog, No. 682, copies of which may be secured direct from the manufacturer by mentioning this magazine.

Diverse Interests Mark Groups Paying for Roads

Each group of taxpayers providing state and local governments with highway income has different interests which deserve consideration. Bertram H. Lindman, engineer-economist of the National Highway Users Conference, stated in a paper presented before the Highway Research Board of Iowa State College recently. There are three distinct sources of highway income originating from different taxpaying groups, Mr. Lindman said, and each has its own special interest in how the money is spent.

A primary type of income is that re-

ceived by state highway departments from registration fees, gasoline taxes, etc., which highway users pay in the belief that these funds are to be expended in providing them with highways. Another source of income is the special assessment on real estate which property owners pay with the understanding that the funds are to be expended upon streets and highways that provide access to their property. A third source of income consists of general taxes which only in part are used for highway purposes.

"When we are spending the highway users' money," Mr. Lindman said, "we should have in mind the best interests of the highway user. When we are spending special assessments, we should keep before us the best interests of the property owners who provide the funds; and when spending general tax receipts, we should keep before us the objectives of furthering the best interests of all the citizens such as promoting national defense, education and community life."

New Heavy-Duty Jack For Emergency Use

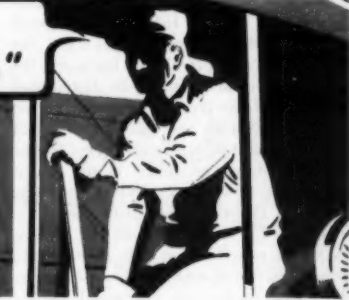
For use on construction jobs and in state and county highway department garages and shops where heavy machinery is used and the need for a heavy-duty jack frequently arises, Templeton, Kenly & Co., Chicago, Ill., has recently announced a new 20-ton emergency jack.

Designated as No. 2030, this jack is 30 inches high, has a full 17 3/4-inch lift, weighs 167 pounds with complete equipment, and has a full 20-ton lifting and holding capacity on either the cap or toe lift. Besides this it lifts on the auxiliary shoe which hooks into the cap or on the chain with the grab hook end, any link of which can be engaged with the recess in the cap.

In addition to lifting and lowering vertically, this jack tilts on its base for jacking at an angle, and the tilting pawl can be released by the operator's toe. It can also be used horizontally for pushing, spreading or pulling.

"THIS BUCKET SURELY DIGS"

•Two Williams Buckets are owned by George Slade, General Contractor, Bridgeton, N. J. About the rehandler bucket used to load crushed stone and slag into trucks, he writes, "It is a marvelous rehandling bucket. Two to three dips and the truck is gone."



About his 1/2-yard digging bucket, he says, "When it comes to excavating ditches, cellars and pipe lines, this bucket surely digs. We don't believe better buckets are built."

Send for free bulletins. They explain the fast, powerful action and rugged strength which make Williams Buckets so profitable to their owners.

THE WELLMAN ENGINEERING CO.
7012 Central Ave., Cleveland, Ohio

WILLIAMS Buckets
built by WELLMAN

EQUIP YOUR ASPHALT PLANT with a MADSEN PUG MILL



MADSEN mixers have a reputation for longer life and faster operation. They mix and discharge faster. Mixer wearing sections and paddle tips made of high-test white iron. Broad-faced steel cut tooth timing gears. Mixer shafts of high tensile steel and real built-in value assure the operator of the lowest possible operation cost. Horse-power requirements are low because these mixers are scientifically designed.

500 lb.—1000 lb.—1500 lb.—2000 lb.—3000 lb.—4000 lb.—and 6000 lb. capacities.

The MADSEN PUG MILL is the one you need on your job.

MADSEN
IRON WORKS

HUNTINGTON PARK, CALIFORNIA

Penco CORRUGATED METAL CULVERTS

Easily installed—no delay and no maintenance. Guaranteed to meet U. S. and State Highway Specifications.

Durable . . . Permanent . . . Low Cost

One-half or entire surface bituminous coated as specified.

Phone or write
PENNS. METAL CORPORATION OF PENNA.
48 Grange Avenue, Philadelphia, Pa.

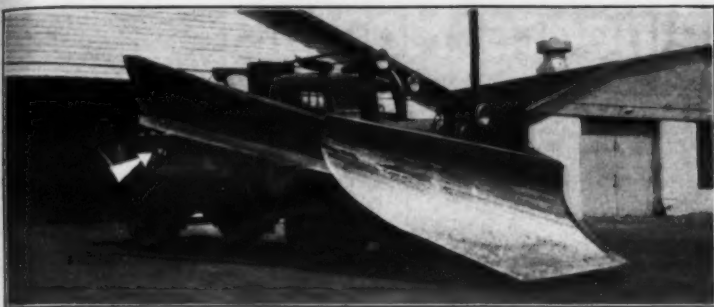
Direct Subway Entrance to all Points of Interest

New York's Popular
HOTEL LINCOLN
44TH TO 45TH STS. AT 8TH AVE.

1400 ROOMS from \$3.
Each with Bath, Servitor, and Radio. Four fine restaurants acclaimed for cuisine.

MARIA KRAMER
PRESIDENT
John L. Horgan
Gen. Mgr.
HOTEL EDISON
SAME OWNERSHIP

IN THE CENTER OF MID-TOWN NEW YORK



C. & E. M. Photo
One of Onondaga County's Snow Fighters. Note the spotlight on the body to illuminate the snow wing for the benefit of motorists coming up from behind the truck.

No Unimproved Roads In Onondaga County

(Continued from page 35)

tion of the equipment when in use. It records the period of activity of a machine, not merely when the engine is running, on a disc which is slowly moved by clockwork. Periods of activity are indicated by a continuous red band, and periods of inactivity are indicated by blank space. The use of these recorders on Onondaga County trucks has proved most helpful to show the actual location of trucks and, when coupled with the records of telephone calls at the County Office, has been helpful in checking effectively the operations of some trucks involved in accidents, greatly to the benefit of the county.

The County Quarry

The blue limestone quarry located at the Jamesville Shops has a 30-foot face which is being operated at present and which can be extended another 30 feet downward. Drilling is done with a Loomis well drill, operated by a Sullivan stationary compressor, and block-holing is done with Sullivan jack-hammers. A tippie car is loaded by hand in the quarry and then run by gravity down to the No. 8 Austin gyratory crusher and thence to a scalping screen. The material passing the screen drops to four No. 5 Austin gyratory crushers and then is elevated to the screen house by a bucket conveyor.

The crushed stone is screened into four sizes as follows: 2 to 1½-inch, 1½ to ¾-inch, ¾ to 3/16-inch and dust. The screened materials are run out by belts to outside storage piles. The screened material can be loaded direct to railroad cars on an adjacent siding by gravity, or into trucks.

County Road Construction

The area of Onondaga County is 781 square miles and there are no unimproved roads in the entire county highway system. The mileage of county roads, in accordance with the New York State classification, is:

Black pavement	0.00 miles
Concrete	217.58 miles
Bituminous concrete and sheet asphalt	0.00 miles
Bituminous macadam, penetration	36.29 miles
Bituminous macadam, plant-mix	2.61 miles
Bituminous macadam, retread or road-mix	1.62 miles
Waterbound macadam	57.45 miles
Gravel, shale, etc., surface-treated	437.70 miles
Bituminous or cement stabilized	1.65 miles
	757.90 miles

Prior to 1932 the county operated three concrete paving units, doing all of its own paving by day labor. The program for the next 10 years is to be devoted to maintenance and reconstruction because the county has the maximum mileage of paved roads which it can afford to maintain.

Gravel roads are built 20 feet wide with a center depth of 9 inches of gravel feathered to the edge and laid on a flat subgrade. These roads are first stabilized with clay, silt, sand and loam and then are treated with 1¼ pounds per square yard of Solvay calcium chloride. The annual treatments following con-

struction are two applications of calcium chloride amounting to ½ pound per square yard each. The use of calcium chloride in the construction and maintenance of these gravel roads makes it possible to keep them in good condition by blading not more than five times a year, while without such treatment continuous blading would be necessary with its consequent loss of gravel. The stabilizing program has prevented loss of gravel and in the 8 years since it was instituted not more than 1,000 yards of gravel have been replaced on the entire system.

New Mobile Crusher For Highway Work

County and town highway departments have in the past few years taken advantage of the WPA to carry on much-needed road maintenance, repairs and small road reconstruction jobs. Usually such work requires the production of aggregate and it has been found economical to produce it at or near the site of the work, if possible.

The Rogers mobile crusher, made by the Rogers Iron Works Company, Joplin, Mo., was particularly designed for such jobs where materials to be crushed are windrowed along the side or in the center of the road, or where a temporary crushing plant is set up at the side of the work. The material to be crushed usually is taken from the ditches or worked to the surface through maintenance, from old fence rows, or from nearby fields. A moderate-length belt conveyor may be used with the crusher for stacking crushed material in a large windrow or stockpile or a folding bucket elevator can be attached for less tem-

porary set-ups to elevate the material into a storage bin or stockpile.

These crushers, which are powered with either gasoline or diesel engines of 30 to 45 hp, are available in crusher sizes of 9 x 16, 10 x 16, 10 x 18 and 10 x 20. They are mounted on a ship-channel frame, with front and rear truck axles, the front equipped with single pneumatic-tired wheels and the rear with dual pneumatic-tired wheels. The 9 x 16 model is 4 feet 2 inches and the other three 4 feet 4 inches in height from the ground to the feed hopper, the overall length is 11 feet 6 inches or 12 feet, and the overall width ranges from 5 feet 10 inches to 6 feet 8 inches.

Further details on these Rogers mobile crushers may be secured by those interested direct from the manufacturer by mentioning CONTRACTORS AND ENGINEERS MONTHLY.

Wire Rope's Service Life Depends on Its Handling

In order to get the most out of men or mules, they must be handled properly, and this same rule applies to wire rope. No matter what the quality of the rope when new, its service life depends mainly on its correct handling from the time it is first put into use through all the various stages of its service.

An interesting and helpful booklet entitled "Correct Handling of Wire Rope" contains a number of suggestions and hints for wire rope users, beginning with the matter of wire rope storage, ways of rewinding, methods of seizing wire rope, winding rope onto a drum, fastening the end to a reel, and detailed directions for attaching mandrels and

sockets to wire ropes.

Copies of this booklet may be secured by those interested direct from the Union Wire Rope Corp., 21st & Manchester Ave., Kansas City, Mo., by referring to this item.

You Get

- ★ MORE POWER
- ★ SAFETY
- ★ SPEED
- ★ EASE OF OPERATION

FOR THE MONEY WITH
AN ELECTRIC

Mall Saw



Cutting capacities:
1½", 2½", 3½",
4½", 5½", 6½",
8½" to 12"

Balanced for
easiest weight
on long end of
board.

**PRICED WITHIN REACH OF
EVERY CONTRACTOR**

No contractor need be without one of these powerful, fast and efficient electric saws that handles every cutting job at a profit. They are beautifully streamlined, sturdily constructed and designed so that the greatest part of the weight rests on the long end of the board. Thus, they eliminate all blade binding near end of cut and assure a perfect balance for safe, one hand operation. Each model has spring safety guard, loop handle with built-in switch, and swivel base for bevel cuts to 45 degrees.

Write today for FREE demonstration and descriptive literature

MALL TOOL COMPANY

SUBSIDIARY OF HAPPAET INCORPORATED and HAPPAET
GEAR WORKS, Manufacturers of former HAPPAET and
ALTA products.

7743 South Chicago Avenue, Chicago, Ill.

Mall
TRADE MARK

CONCRETE VIBRATORS

A Type and Size for Every Construction Job ...
Gasoline Engine, Air and Electric Models

Let us tell you how you can get better quality concrete and make bigger profits with savings in labor, cement and power by using these efficient multipurpose power tools.

Ask for a demonstration today! No cost or obligation.

MALL TOOL COMPANY

7743 South Chicago Ave.
Chicago, Illinois

Offices and Distributors in Principal Cities



MALL 7000 r.p.m. gasoline powered vibrator on pneumatic mounting. Can also be used for CONCRETE SURFACING, PUMPING, SAWING, DRILLING, SANDING and GRINDING.

MODERN

TURNPIKE!

MOBILITY is the theme of the great, new Pennsylvania Turnpike... built for high speed, smooth operation, and long wear. Modern MICHIGAN Shovels feature these same advantages. **HIGH SPEED**, both in travel and in use. **SMOOTH OPERATION**, through famous Air Controls, rubber tired chassis. **LONG, HARD WEAR**—proved by over ten years' strenuous use. No wonder MICHIGAN was selected for maintenance work on "The Turnpike"! Get full facts and data now.

Write Today for Work Book C-110

MICHIGAN POWER SHOVEL © BENTON HARBOR, MICHIGAN, U.S.A.

Contractors and Engineers Monthly

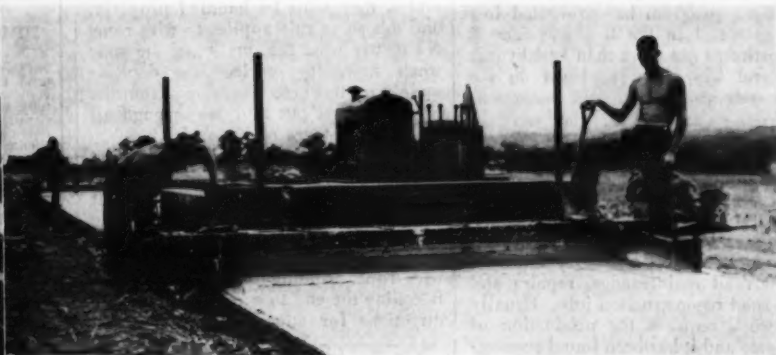
M. H. Mogren, subcontractor on sodding, placed sod by hand on the slopes of all cuts and all ditches on a 6.2-mile grading project in Minnesota, for which W. W. Magee was contractor. See page 19.

C. & E. M. Photo



C. & E. M. Photo

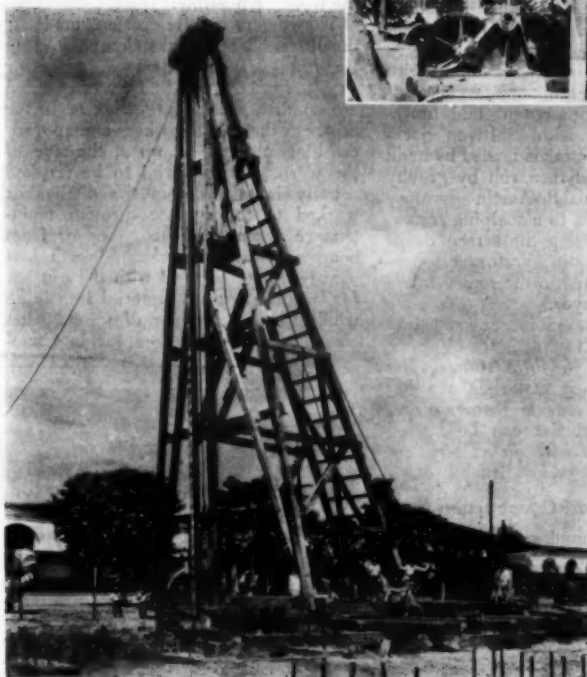
Watering newly placed sod with "two hoses to once" to give the grass a good start in its new location on Mogren's 6.2-mile sodding subcontract on a grading job near Rockford, Minnesota.



Crumley-Jones & Crumley, contractor for a 6-mile concrete paving job at Utopia, Ohio, used truck mixers which dumped the concrete into the Jaeger spiral spreader, shown at left. As soon as the concrete was spread, a Jaeger-Lakewood double-screed finisher, above, went into action. See page 15.



In Onondaga County, N. Y., they still have what many city dwellers fondly call "a good old-fashioned winter," but its Highway Department is prepared for the worst. Here a county unit is widening a plowed section of a highway on February 23, 1940. See page 1.



Half-way round the world, American construction equipment is on the job. Here a Clyde three drum hoist and swinger, powered by a 55-hp Cummins diesel engine, is at work for the Bureau of Public Works in Manila, P. I. Above is a close-up of the hoist.

Because of the public's great interest in construction, a visitors' lookout and relief map of the project under a shelter are provided for "sidewalk superintendents" at Franklin Falls Dam.

C. & E. M. Photo



C. & E. M. Photo

A portion of the gravel crushing, washing and screening plant to produce the aggregate for Franklin Falls Dam, N. Y., said to be the largest such plant east of the Mississippi. See page 2.